THE CHEMIST AND DRUGGIST

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THE MEDICAL INQUISITION.

The Chemists and Druggists of England are an unfortunate race. They work early and late, on Sundays and week-days, and all to be rewarded with more kicks than half-pence. They are abused by rigid pharmaceutists for dabbling in "sundries;" are dammed up within certain limits by meddling Acts of Parliament; and are looked upon with active jealousy by the whole medical profession. If they glance at an errand boy's tongue; suggest an effervescing cure for convivial excess; or give a child a spoonful of liquid senna as a remedy for worms, they are liable to be prosecuted for injuring "the faculty." The surgeon in the next street has a legal right to all the invalids in his district, and no one, whether led by whim, convenience, or motives of economy, dare ask a druggist any questions about his bodily ailments. To do so is to nourish "illegal practice," and although the penalties, according to the Medical Acts, are paid by the answering chemist, the babbler about head-aches, and pains in the stomach, is certainly the first offender. The chemist professes to do nothing but to sell certain drugs and chemicals, and he hangs out no sign to attract consulting custom. His lamp is not more dazzling than that of his neighbour's—the surgeon's; his night-bell is not more prominent, his knowledge of ordinary medical practice may be almost as great, and his knowledge of chemistry, botany, and toxicology may be far greater—and yet, if he ventures to suggest that one drug will produce sickness, and that another is a good tonic, he is breaking the seal that Parliament has placed upon his lips. Without an empty diploma from Apothecaries' Hall, where licenses to dispense medicine are granted upon a very hollow examination, he has no power to do more than sell what is asked for. The moment he steps over this legal barrier, he lies at the mercy of every petty informer.

A meddling aggressive act of legislation is nothing if not vigorously carried out, and we are not surprised to see "the faculty" combined as prosecutors. "*The London Medical Registration Association*," with its numerous branches, is growing apace, and its constitution reminds us somewhat of the old Inquisition. It lays a claim to the protection of all "orthodox" practitioners, and the punishment of all heretical chemists. Its chief object, according to its rules, is "to watch the working of the Medical Act, to suppress illegal practice, and to assist the Registrar under the Act in securing a correct registration." Its acting officers are called a "Vigilance Committee;" its meetings are secret; its communications are private and confidential; it shrouds itself in what its admirers term an atmosphere of diplomatic mystery; and its chief record is called a "black book." It is not offended when spoken of as an important medical police, notwithstanding the national dislike to spies and detectives. Whether the notorious Inspector Field is a paid vice-president of the Association, we are unable to say, but we can see no just or moral reason why he should not be appointed. The kind of work that must occupy the Medical Inquisition would be much better done by such professional hands, and many stains would thus be removed from a body of educated gentlemen. If the "black book," or secret journal, of the Association could be thrown open, we should not be surprised at the mean absurdity of its revelations. For one act of "illegal practice" recorded against a member of the trade, we have no doubt we should find a hundred acts of the lowest *espionage* on the part of the medical profession. We should not be astonished to find fathers of families marked with the black cross, because they read the *Lancet* with amateur relish, and prescribe a little "opening medicine" when their children are feverish. We believe that the Association have uttered the most violent threats against tamarinds, brimstone and treacle, and other favourite domestic medicines; and that when the most active members of the Inquisition gather a little more courage, they will burn "Buchan" and "Culpepper" in the public market-place.

All this would be very amusing both to friends and foes, did not a great injustice lie underneath this inquisitorial action. The Medical Bill, which breathes into it the breath of life, ought never to have become an act of legislation. It only shows what one united body can do to injure another, which is not united. The chemists and druggists are confined in fetters they have not deserved, under the hollow pretence of a regard for the public. The public are told, by Act of Parliament, that they have no liberty to choose their medical adviser. They must be physicked by Codling, and not by Short, because Codling is in possession of an Apothecaries' license. The operation of this is decidedly protective, to say nothing of its "unconstitutional" character. It checks competition, and "makes things snug" for that profession by whom and for whom the bill was prepared and passed. There are many trades, professions, callings, and occupations in this country that have to find their own level without any legislative patronage. If too many practitioners rush into them, the rate of remuneration falls, and never rises until the demand increases, or some of the members seek a better field for their industry. There is hardly one of these "interests,"—as they are always called, when any act of jobbery is in contemplation,—but what would like to have a bill passed prohibiting all encroachments on their borders, except by those who have gone through a long, formal, costly, and showy preparation. Those who are already in these professions would soon reap a benefit from this, but not so the public, or those who are outside. For this reason, such bills have always been opposed, of late years, and free trade has been the guiding principle of our law-makers. The medical profession, however, have taken advantage of a little sentiment in their favour, and have obtained an Act which is a pernicious example of class legislation.

A profession so sensitive about trespassers on its property ought surely to be very scrupulous about the property of others. No one who examined the Medical Bill alluded to, would suspect that "doctors" ever broke into "trade." A knowledge of the profession, however, proves, beyond a doubt, that medical men hanker after the small profits of drug-selling. It is not enough that the law gives them a practical monopoly of prescriptions; they also wish to become chemists and druggists. A well-informed correspondent of a contemporary asserts that the medicines dispensed by doctors are often made up by their wives, their ostlers, or their boys in buttons. Another correspondent, quoted in our last number, says: "Surgeons, general practitioners, or by whatever name they are called, hold themselves forward to the public as professional men, and yet they carry on a greater trade in drugs, in many instances, than their neighbour, the chemist and druggist. The fact of their being allowed to combine a trade and a profession, induces them constantly to send the patient a little of something that will do him good! Further, it is a notorious fact, to those in the trade, that surgeons are the worst judges of the quality of drugs; in fact, they scarcely pay any attention to them when received into stock; they are put away by the man who *does* the medicine—this man being sometimes the groom, or a broken-down dispenser, totally unacquainted with pharmacy and materia medica. With regard to medical men, let me be clearly understood; they generally gain their knowledge of the doses and properties of drugs from *books*, or some very superficial dispensing." This is from "one behind the scenes," and without such testimony we might boldly offer to test every chemist and druggist—taking them as they come—against every medical man, selected in the same manner, by a thorough examination in chemistry, botany, and toxicology. The superficial examinations passed at Apothecaries' Hall by medical practitioners, who wish to become dispensers, are so notoriously loose and unsatisfactory, that we have no doubt the trade would prove triumphant in its own proper province.

The College of Physicians are already following the example of their humbler brethren, and combining to injure or destroy the chemical profession. They have created a third class of medical men, who are to be designated "Licentiates of the College of Physicians," and who will be practically nothing but Apothecaries. It is true that they will be confined to dispensing medicines for their own patients only, but this is another secret mode of undermining "the trade." The apothecaries have objected to this movement, and legal opinion has been taken, but the result is, that the college is confirmed in the legality of its proceedings, and the work goes briskly on.

This anxiety on the part of the medical profession to fence themselves in with legislation, and to protect their interests by aggressive combinations, and a secret inquisition, is an infallible sign of weakness. It looks as if their Art had little of real learning in its mysteries, and was in danger of being exposed. It looks as if there was some truth in the old suspicion, that doctors are only daring guessers when they get beyond manipulative surgery. It also looks as if they were determined to force their costly services upon the public, whether they may be required or not.

A NEW CANDIDATE FOR WEBSTER.

LOGIC, according to Watt, "the right use of reason," has been defined also, and with greater directness, as the science or knowledge of words. One of the principal branches of this science is the rule of definition, which is simply that the terms used shall always include the object which they are intended to represent, and exclude all others. This most important rule has been, unfortunately, but too generally disregarded in the formation and use of words, more especially in the English language; the consequence is, that an infinite number of words have crept in, either altogether nonsensical, or with some fanciful conventional meaning attached to them, utterly irreconcilable with their true and etymological meaning. One of the most glaring instances of a total disregard of the rule of definition may be seen in the title of this journal, the *Chemist and Druggist*. The conventional meaning attached to this curious "Siamese-twin-formation" is to designate one who compounds and dispenses medicines. Now, the word "Chemist," in its proper and only admissible sense, means one who professes or pursues Chemistry, that is, "the science which investigates the intimate structure of bodies, aims at the discovery of their elementary substances, the nature of the various compounds producible from them, and the laws of their production." A druggist, or drugstér, is "one who *sells drugs*," that is, "the materials used in the preparation of medicines." Neither of the two words bears the remotest relation to the "*compounding and dispensing* *of medicines,*" which yet constitutes the leading feature of the profession to which they are thus jointly applied. Although we have often felt the inconvenience of this unmeaning compound, yet we have continued to make use of it, partly from the force of habit, and partly also from a very natural reluctance to venture upon the creation of a new word as a substitute for it, lest, like him who gave us the word telegram, we should have to encounter the fierce attacks of ultra-conservative Oxford and Cambridge linguists for our "ignorant meddling with sacred things." However, at length we have taken heart of grace, and made up our mind to discard henceforth the obnoxious "*Chemist and Druggist,*" and to use instead the word "*Pharmacist*" in the columns of this journal.

The word "Pharmacist" is formed from Pharmacy, strictly according to existing analogies; look, for instance, at Botany, Botanist; Alchymy, Alchymist; many words from the Greek, ending in logy, nomy, tomy, as (*e.g,*) Philology, Philologist; Geology, Geologist; Physiognomy, Physiognomist; Anatomy, Anatomist, &c. The formation of —— graphist—in words such as Telegraphist, Heliographist, Photographist, which has, more especially of late, taken its stand by the side of the formation in *er* (Photographer, &c.)—affords also a powerful argument from analogy in favour of Pharmacist, γρᾶφεὺς, from which "graphist" is derived directly, being formed exactly like φαρμᾶκεὺς, which, therefore, surely may serve the same purpose for Pharmacist.

The word "Pharmacist" corresponds exactly to the French "*Pharmacien,*" and correctly renders the idea of a "compounder and dispenser of medicines." It is also the exact equivalent of the German "*Apotheker*" in its universally received, though simply conventional, meaning. It might, perhaps, be objected here, that the English word "apothecary" would have answered our purpose equally well; to this we reply, that an "apothecary" has, in progress of time, come to mean a great deal more in England than a simple compounder and dispenser of medicines, being, in fact, now the title given to general practitioners, at least in their collegiate capacity. A similar objection applies to the use of the word "*Pharmaceutist,*" which is now generally held to mean a member of the Pharmaceutical Society. Of the two remaining words of the kind found at present in the English Dictionary, the one, "*Pharmacologist,*" means a writer on drugs; the other, "*Pharmacopolist,*" a vender of drugs. Neither of them, therefore, will answer *our* purpose. There remains, then, only our proposed word, "*Pharmacist,*" which we accordingly beg to recommend to the favourable consideration of our readers, wishing it "God speed!"

TO OUR READERS.

In issuing this, the *first* number of our New Volume, we may be permitted to call the attention of our readers to the gratifying fact, that not only have the improvements promised in our last been fully carried out, but others, of no less importance, have been initiated. In proof of this we need simply refer to the tasteful emblematic illustrations which figure as headings to the several departments of the Journal. Our readers may, moreover, rest assured that we by no means wish them to accept these improvements as a full and final settlement of our account of promises, but simply as an earnest of the sincerity of our desire to make the *Chemist and Druggist* the first and foremost publication of the day in every branch, practical as well as theoretical, which it embraces, and to render it equally useful and interesting to the Chemist, the Pharmacist, the Druggist, and the Manufacturer. No trouble or expense shall be spared on our part to realize this programme to the fullest extent; and so, whilst looking back with honest pride to the past, we trust we are justified also in looking forward with hopeful confidence to the future.

THE NEW SOCIETY.

THE readers of this journal have doubtless felt much curiosity as to the condition and prospects of the New Trade Society. From time to time we have reported progress,—have published lists of adherents,—and have given the Association that support and assistance which we consider it fully merits. It is now our pleasing duty, at the commencement of the New Year, when many old resolves are broken, and many new resolves are made, to endorse all we have previously said in favour of the proposed scheme. Its growth has been marvellous, when we consider the short time it has been before the trade, the slender agencies at work to push it forward, and the economical character of its organization. It is already taken out of the catalogue of mere projects; it has struck root deeply and widely; and it only needs a few months more patient industry on the part of the promoters to train it into a perfect and permanent institution. Many difficulties have been overcome, and many still exist to be overcome; but so many members of the trade have expressed such a generous confidence in the Society and its objects, that the least sanguine amongst us can have no doubt as to the result. The following letter from Mr. C. F. Buott, the indefatigable Secretary, speaks for itself :—

25, Bow Lane, London, 14th January, 1861.

UNITED SOCIETY OF CHEMISTS AND DRUGGISTS.

SIR,—I have much pleasure in briefly laying before you the present position and prospects of this Society.

The promoters, while admitting that its objects may possibly be altered or improved in their actual working, have been thoroughly impressed with a belief in the practical advantage of co-operation, as a protection for a trading community which is constantly open to legislative crippling, and which gives so little return for the knowledge and capital it requires.

To bring about this co-operation, a personal canvas has been conducted, which has, with an active correspondence, already obtained the adhesion and support of upwards of 700 members. Out of this number I have the honour to announce that the following gentlemen have kindly sconented to act upon the General Committee :—

TOWN.

Ablitt, B., Mare-street, Hackney.
Allen, J., High-street, Stoke Newington.
Allinson, John, Norton Folgate.
Anderson, Brothers, Duke-street, Manchester-square.
Baker, F. B., Queen's-road, Dalston.
Baldock, E. C., 30, Aylesbury-street, Clerkenwell.
Baxter, Wm. B., Bromley.
Bland, W. H., Upper-street, Islington.
Bovill, F. A., 24, Park-terrace, Regent's-park.
Buck, T., Kingsland-green.
Bush, William, James-street, Walworth.
Canning, Wm., 173, Sloane-street.
Chaplin, S., Tothill-street, Westminster.
Chubb, J. C., 59, St. John-street.
Clayton, G., 315, Regent-street.
Cooke, John, High-street, Hoxton.
Corder, John, 4, Edward-street, Kensington.
Crotch, James, 31, Edgeware-road.
D'Aubeny, T., Shepherdess-walk, New-road.
Edmunds, James, Spital-square.
Flower, J. J., Prospect-house, Old Brompton.
Freeman, J. A., 13, Blackfriars-road.
Gibbins, T. H., Lower Eaton-street, Eaton-square.
Green, Josiah, Townshend-road, St. John's-wood.
Hardy, George, Alexander-place, Brompton.
Harper, J., Queen's-row, Pimlico.
Howard, G. R., Park-row, Greenwich.
Hunt and Co., 24, Exmouth-street, Clerkenwell.
Huxtable, W. and J., 104, St. John-street.
Jones, Henry, Pelham-crescent, Brompton.
Kernot, G. C., Poplar.
Lacy, B. W., Westbourne-terrace.
Lamplough, H., 113, Holborn.
Linder, Charles, 104, Strand.
Loane, J., 1, Dock-street, Leman-street.
Lowe and Wilde, King's-road, Chelsea.
Moore, G., Tower-hill.
Morgan, Brothers, Bow-lane, Cannon-street.
Newbery, F., and Sons, 45, St. Paul's-church-yard.
Philips, Wm., New-cross.
Potter, J., Dudley-grove, Harrow-road.
Preston, Brothers, Smithfield-bars.
Rixon, J. B., Amherst-road, Hackney.
Roper, C. R., Church-street, Hackney.
Sangster, Thomas, Long-lane, Smithfield.
Shaw, E. T., Lower-road, Islington.
Shepherd, W. L., Gray's-inn-lane.
Strickland, W. H., Pelham-house, Brompton.
Travers, J., Millpond-street, Bermondsey.
Venman, H., 4, Tatchbrook-street, Pimlico.
Vizer, E. B., 63, Lupus-street, Belgravia.
Wade, John, York street, Westminster.
Wellspring, J., Chandos-street, Strand.
Williams, F., London-street, Paddington.

COUNTRY.

BATH, Davies, Jameson, and Co , Old Bond-street.
BIRMINGHAM, Banks, Morris, Bull Ring.
BRISTOL, Caird, J., Castle-street.
GATESHEAD, Stainthorpe, James.
GRAVESEND, Spencer, Charles.
HULL, Reinhardt, J. C., Market-place.
JERSEY, Le Feuvre, F., Bath-street.
LIVERPOOL, Johnson, J. H., Church-street.
MANCHESTER, Mottershead and Co., Market-street.
MARKET RASEN, Jevons, Edward E.
NEWCASTLE-ON-TYNE, Brockett, R. W., Grey-street, Newcastle-on-Tyne.
PETERBORO', Griffin, J. C.
SHREWSBURY, Phillips, Thomas.
SOUTHAMPTON, Manby, George.
TAUNTON, Hitchcock, R.
TENTERDEN, Smith, Alfred W.
ULVERSTON, Mackereth, H. W.

These gentlemen purpose calling an Open Meeting of the Trade, on Wednesday, the 23rd instant, at the London Coffee House, 24, Ludgate Hill, City, at 10·30 A.M., for the full discussion of the Society's objects, which are principally the establishment of a Benevolent Fund—the Shortening of Long Hours and Sunday Work—Protection from Legislative Restriction—An Open Registry for Business, Partnerships, and Situations—A Trade Club, and a Rudimentary School for Members' Children. The same co-operation required for the carrying out of any one of these objects will suffice to carry out them all.

C. F. BUOTT, Secretary, *pro tem.*

This letter requires little comment on our part. It shows us what has been done, and what yet remains to be done. The names on the working committee are a guarantee that the Society will not be mismanaged at its outset; its future will rest with the Trade, who have power to mould it into good or evil. The work now to be done must be done at once, and those will be doing it best who attend the meeting. Country members, who cannot attend, will be doing their part, by sending in their adhesion as members without delay. The form of membership will be found amongst the advertisements at the end of our journal, and so printed that it can easily be detached, and returned by post.

QUANTITATIVE ANALYSIS.

BY DR. HENRY M. NOAD, F.R.S.

QUANTITATIVE ESTIMATION OF LIME AND MAGNESIA, AND THEIR SEPARATION FROM THE ALKALIES.

Oxide of calcium, or *lime*, is weighed either as *sulphate* or as *carbonate;* the former salt being soluble, to some extent, in water, it is necessary to add to the solution about to be precipitated by sulphuric acid, about twice its volume of alcohol or methylated spirit, and to wash the sulphate on the filter with the same. After ignition its composition is—

One equivalent of CaO	28·0	41·17
One do. of SO_3	40·0	58.83
One equivalent of $CaO\ SO_3$	68·0	100·00

When a lime-salt exists in aqueous solution, it may be completely precipitated by the addition of oxalate of ammonia; if a free mineral acid is present, it must be previously neutralized by ammonia, oxalate of lime being very soluble in mineral acids, though not so in either *acetic* or *oxalic* acids. The washed and dried oxalate of lime is converted either into *carbonate* by simple ignition, or into *sulphate* by digestion with strong sulphuric acid: the latter is preferable. The oxalate is introduced into a platinum crucible, covered with oil of vitriol, and evaporated to dryness, the last trace of free acid being expelled by a red heat. When the lime-salt can only be held in solution by a mineral acid—as, for example, in *bone-earth*, where it exists as *phosphate*—advantage is taken of the insolubility of oxalate of lime in acetic acid to effect its accurate estimation. The compound is dissolved in hydrochloric acid, oxalate of, ammonia is added, and the solution is boiled; *acetate of ammonia* is then added in excess upon which the whole of the lime falls as oxalate, which is converted into sulphate, and weighed as such.

Oxide of magnesium or magnesia.—This earth is almost invariably weighed in the form of *pyrophosphate*, by precipitating it from its solution by *common phosphate of soda*, having previously added abundance of solution of *chloride of ammonium* and excess of *ammonia*. The mixture is well agitated, and allowed to stand for several hours; the *ammonia-magnesian phosphate* which has subsided is then collected on a filter, and washed with water containing about *one-tenth* of ammonia; after being dried, it is ignited, by which the ammonia is expelled, it thus becomes pyrophosphate of magnesia, the composition of which is—

Two equivalent of MgO	40·0	36·04
One do. of PO_5	71·0	63·96
One equivalent of $MgO\ PO_5$	111·0	100·00

When no other fixed constituent is present, magnesia may be estimated as *sulphate*, by evaporating to dryness with excess of sulphuric acid, and then igniting; anhydrous sulphate of magnesia is thus produced, the composition of which is—

One equivalent of MgO	20·0	33·33
One do. of SO_3	40·0	66·67
One equivalent of MgO, SO_3	60·0	100·00

When lime and magnesia have to be separated from each other, abundance of chloride of ammonium is first added, then ammonia in slight excess, and lastly considerable excess of oxalate of ammonia. After standing for ten or twelve hours, the clear fluid is filtered off from the precipitated oxalate of lime, which is converted into sulphate, and weighed as such; the filtrate and washings (concentrated, if necessary, by evaporation) are precipitated by phosphate of soda, and the magnesia estimated as pyrophosphate. If the proportion of magnesia is large, a certain quantity is precipitated as oxalate with the oxalate of lime; it is therefore necessary, to ensure accurate results, to re-dissolve the first precipitate of oxalate of lime in hydrochloric acid, and to precipitate it once more by the addition of ammonia, and fresh oxalate of ammonia, the filtrate and washings being added to the filtrate from the first precipitate of oxalate of lime; these two filtrates now contain the *whole* of the magnesia. When the lime and magnesia are in combination with *phosphoric acid*, the compound is dissolved in as small a quantity of hydrochloric acid as possible; ammonia is then added in quantity just sufficient to occasion a copious precipitate, which is then re-dissolved in acetic acid, and the lime precipitated by oxalate of ammonia.

Separation of lime and magnesia from the alkalies.—The lime is precipitated by carbonate of ammonia; ammonia, and a sufficient quantity of chloride of ammonium, having been previously added to the solution, the carbonate of lime is received on a filter, washed, and converted into sulphate, in which state it is weighed. The filtrate and washings are evaporated to dryness, and the ammoniacal salts removed by gentle ignition in a covered crucible; the residue is re-dissolved in as small a quantity of boiling water as possible, in order to make a concentrated solution, and (provided the bases are in the state of chlorides) powdered and perfectly pure red oxide of mercury is added in excess, and the mixture evaporated to dryness on the water-bath, with frequent stirring; when dry it is ignited (under a chimney) in a porcelain crucible, and when cold, thoroughly extracted with hot water; the insoluble portion, after being again ignited, is pure *magnesia*, and is weighed as such; the aqueous solution contains the alkalies in the form of chlorides.

Another method, which gives very accurate results, is to add to the solution of the bases *baryta water*, until a distinct alkaline reaction is obtained, *magnesia* is hereby precipitated, the baryta taking its place; the precipitate is re-dissolved in hydrochloric acid, and the excess of baryta being removed by sulphuric acid, the magnesia is estimated as pyrophosphate. The alkalies are in the solution filtered from the precipitate by baryta water, together with the excess of the latter; this is removed by the addition of carbonate of ammonia mixed with a little caustic ammonia, and the alkalies are separated from each other in the filtrate in the usual manner.

Separation of the alkalies from other bases in the analysis of soils and alkaliferous minerals.—Of the numerous methods that have been proposed, we shall describe that only of Dr. Smith, which we have experimentally proved to be trustworthy and complete. Mix intimately one part of the mineral, finely pulverized, with five to six of pure precipitated carbonate of lime, and one-half to two-thirds of chloride of ammonium; and heat to bright redness, in a platinum crucible, from thirty to forty minutes; dissolve out the contents of the crucible with hydrochloric acid, evaporate to dryness and re-dissolve, precipitate with carbonate of ammonia; filter, boil, and concentrate the filtrate; add nitric acid in some quantity, heat and evaporate to dryness; dissolve the dry mass in a little water, and treat with carbonate of ammonia; filter and concentrate, then add sulphuric acid; boil for a little while, pour in a platinum crucible, evaporate to dryness, and ignite. If magnesia be present, treat with lime-water, boil and filter prior to the last application of carbonate of ammonia. The alkalies are thus brought to the state of *sulphates;* but in order to separate them from each other, they must be converted into *chlorides,* to effect which, they are re-dissolved, and the solution treated with excess of *acetate of lead*, and warmed; sulphate of lead separates, which is filtered off. The excess of lead is removed from the filtrate by sulphuretted hydrogen, and the clear solution now contains the alkalies as *acetates*, which are converted into chlorides by treating with excess of hydrochloric acid, evaporating to dryness on the water-bath, and finally heating to above 500°.

This method may seem lengthy, but it is, in our judgment, by far the best that has been proposed for estimating the alkalies in soils, slags, &c. An important feature in the process is the decomposition and removal of the *chloride of ammonium* (which always embarrasses and annoys the analyst) by treating with nitric acid. Dr. Smith subsequently greatly simplified this process by digesting the fused mass with *pure water* instead of hydrochloric acid. He found that the whole of the alkalies were dissolved as chlorides, together with a little chloride of calcium and caustic lime; the two latter are readily precipitated by adding excess of carbonate of ammonia, and the filtrate contains only the alkaline chlorides of chloride of ammonium; by gentle ignition the latter is expelled, and the alkaline chlorides remain, and may be separated from each other by bichloride of platinum in the usual manner.

REVIEWS

A system of Instruction in Quantitative Chemical Analysis. By DR. C. REMIGIUS FRESENIUS. Third Edition. Edited by S. LLOYD BULLOCK, F.C.S., London. John Churchill.

EVERY English disciple of practical chemistry will hail with delight the appearance of this new edition of the great German work on Analysis, and will join us in a vote of thanks to Mr. Bullock, the editor, and to Mr. Churchill, the publisher of the volume.

The present edition (the third English), which corresponds with the fourth German, has been re-cast, considerably simplified, and almost re-written. New matter has been introduced to the extent of one-fourth of the whole volume, and this without materially increasing its size. Many of the processes—the best then known, but rendered obsolete by the progress of science—have been replaced by others more simple, certain, and efficient. The per centage composition of the compounds obtained in analyses has been re-calculated in accordance with the latest determination of atomic weights; and the special part has been enriched by the description of the various new processes of technical analysis.

We will briefly refer to the improvements, and additions which have principally arrested our attention, whilst carefully examining this edition, and comparing it with the *first.*

First, then, we find under the head of "measuring," minute directions given for determining the volume of gases, in accordance with the methods of Bunsen, Regnault, and Reiset, whereby an accuracy, nearly equal to that of weighing, has been established: various new graduated pipettes and burettes for the measurement of liquids are described and figured, particular notice being taken of the excellent apparatus of Mohr, with its caoutchouc connector and compression clamp. The chapter on re-agents has been much improved, and extended by a description of those used in volumetric analysis. Among the new re-agents we note especially the *acetate of sesquioxide of uranium* for the separation and quantitative determination of phosphoric acid, the method of preparing which from pitch-blende is fully described.

Not the least important part of this new edition is that which relates to *volumetrical analysis.* The author observes that when the new system first began to find favour with chemists, a great many volumetrical methods were proposed, based simply upon some final re-action, without a careful study of the ensuing decomposition; the result has been a superabundant crop of new volumetrical methods, of which a great many are totally fallacious and useless. Fresenius has exercised his matured judgment in separating the really good methods from the fallacious; and in the special part, he shows that volumetrical analysis has not lately received the great accession of good methods which is generally supposed.

In speaking of the two volumetrical methods of estimating iron, viz., that of Marguerite by permanganate of potassa, and that of Penny by bichromate of potassa, Fresenius says, "The first has the advantage, that the termination of the process of oxidation is clearly indicated by the reddening of the solution; whilst the second, on the other hand, has this very essential point in its favour, that the solution of bichromate of potassa may be easily prepared and kept unaltered." From this observation, we infer that crystallized permanganate of potassa is not in Germany an article of commerce; and, indeed, the solution, as obtained by the process given by the author (p. 90), is very unstable, and constantly requires verification; in this country, however, perfectly pure crystals of permanganate of potassa can be obtained at a moderate price, the aqueous solution of which, being quite free from *manganate,* remains (in well closed bottles) unchanged for any length of time; for the determination of iron, in iron ores, we are in the habit of employing a solution, made by dissolving 100 grains of the crystals in 10,000 grains of water ; and on the whole we prefer this method to that proposed by Penny.

Amongst the new methods of estimating nitric acid, we find no allusion made to that of Dr. Pugh, first described in a paper read before the chemical section of the British Association, at Leeds, in 1858, and published afterwards *in extenso* in the *Quarterly Journal of the Chemical Society;* we notice also that the elegant method of separating iodine, chlorine, and bremine, proposed by Field, in 1857, is simply ignored in a foot note at page 393. We fear, therefore, that the learned author has been less diligent in searching English scientific periodicals, and less attentive to processes discovered by English chemists, than he might have been. Mr. Field has lately shown (see *Chemical News*, Dec. 22nd, 1860,) that his method is an accurate one, and has rendered it probable that Fresenius neglected to give it a fair trial.

In the *Special Part,* we find the article on the "Analysis of Mineral Waters" improved by an illustrated description of the method of collecting the gases ; a chapter on "Acidimetry," with Bineau, Ure, and Mohr's tables is given ; the analysis of *manganese ores* has received especial attention, as has that of *clays, limestones, iron ores, copper pyrites,* and *galena,* including in the latter the determination of the amount of silver ; the analysis of *zinc ores* is described with the volumetrical determination of the metal ; the method given for the analysis of *cast iron* we consider unnecessarily prolix, and wholly unsuited to the requirements of the technical analyst. We must, however, give our unqualified approbation to the chapter on the "Analysis of Soils," which has been greatly simplified and enriched by a description of the operation of "*mechanical*" *analysis.* In the chapter on the "Analysis of Manures," we find directions given for the valuation of *guano, ground bones,* and *superphosphates of lime;* and lastly, the subject of the "Analysis of Atmospheric Air" has been treated in accordance with the latest discoveries in the interesting department of gazeous analysis, as far as relates to the examination of air for technical and medical purposes. In conclusion, we cannot refrain from observing, that the volume would have been made more pleasing to the eye had it been printed on better paper, and had more attention been bestowed on the execution of the wood cuts, which bear no comparison with those in the German edition. The list of errata is also remarkably small, and would lead to the conclusion that the work has been printed with more than ordinary care, but we have noticed many typographical errors, principally in formulæ, which have received no attention ; as for example, in page 176, $Mn._2\ O_2$ is printed for $Mn._2\ O_7$. These may appear to be trifles, but in a work which is so deservedly regarded as a high authority, and which is referred to with so much confidence, too much care could not be taken to make it as accurate as possible, and we would suggest to Mr. Bullock that in the preparation of the next English edition, a few extra hours spent in revision and correction would be time and labour well bestowed.

TOUCHING SPONGES.

ORDINARY sponge is one of those precious common things which largely contribute to the comfort of civilized man. Its uses, which are very numerous, depend on its peculiar flexibility, porosity, elasticity, and compressibility. In the hope of finding another substance with the same properties equally well balanced, we might ransack the three kingdoms of nature in vain. In the attempt to replace this unique product by a manufactured article we might waste as much time as the alchemists of old wasted in their fruitless researches. And this wonderful substance, for which we shall probably never find or make a substitute, is produced by animals in which we can discover no trace of special organs—animals of so humble a type that it is difficult to draw a line of demarcation between them and the lowest plants.

Every one knows that ordinary sponge is an animal product, and that it is fished up from the bottom of the sea by divers. I have reason to believe, however, that the knowledge possessed by the majority of educated persons touching this familiar substance is confined to these two facts. Even well-known authors, who are looked up to as scientific oracles, make dreadful blunders when they come to write about sponge. In a popular modern work of reference now before me, I find it gravely stated that sponge is produced by very small marine animals which are called Polypi by naturalists, whereas it is formed by creatures of another type called Protozoa. To enlighten the ignorant, and to dissipate the errors promulgated by book-makers, I will state a few facts, on the authority of Dr. Carpenter, about sponges, and other animals belonging to the same sub-kingdom. I may here mention that the word "sponge" is applied to the complete animal, as well as to its fibrous skeleton with which we are so familiar.

The sponges belong to the lowest class of animals, and before I can hope to make the reader understand their structure, I must describe the lowest member of the class—a creature which may be said to form the first link in the great chain of life which ends with Man. This microscopic protozoon, which is by no means unfrequently to be met with in stagnant waters and vegetable infusions, is known as the *Amœba.* It may be described as a minute semi-fluid mass of *sarcode,* or formative substance, presenting scarcely any evidence of distinct organization, even of the simplest kind. However inert and shapeless this minute body may be when first noticed, its possession of vital activity is soon made apparent by the movements which it executes, and by the changes of form which it undergoes. The shapeless mass puts forth a finger-like prolongation, which is simply an extension of its gelatinous substance in a certain direction; and a continuation of the same action first distending the prolongation, and then, as it were, carrying the whole body into it, causes the entire mass to change its place. After a short time another prolongation is put forth, either in the same or in some different direction, and the body is again absorbed into it. When the creature, in the course of its progress, meets with a particle capable of affording it nutriment, its gelatinous body spreads itself over and around the precious morsel so as to envelope it completely. The substance thus taken into this extemporized stomach undergoes a sort of digestion, the nutritive material being extracted, and the indigestible part being, as it were, squeezed out of the body. Of the mode of reproduction of the amœba nothing yet is known, save that it undergoes multiplication by self-division, and that portions separated from the mass, either by cutting or tearing, can develope themselves into independent beings. This living speck of jelly, which can get along without legs, and which can convert any portion of its substance into a stomach, may be regarded as the type of the Protozoa.

In the living sponge, the skeleton, usually composed of a fibrous network, strengthened by spicules of mineral matter, is clothed with a soft flesh, which, when examined with a powerful microscope, is found to consist of an aggregation of amœba-like bodies, some of which are furnished with long *cilia* (hair-like appendages) by the agency of which a current of water is kept up through the passages and canals excavated in the substance of the mass. From observations which have been made upon the early development of sponges, it appears that they begin life as solitary amœbæ, and it is only in the midst of aggregations formed by the multiplication of these that the characteristic sponge structure makes its appearance; the formation of spicules being the first indication of such organization. The ciliated cells seem to form the walls of the canals by which the whole fabric of the sponge is traversed. These canals, which are very irregular in their distribution, may be said to commence in the small pores of the surface, and to terminate in large vents; and a current is continually entering at the former and passing forth from the latter during the whole life of the sponge, bringing in alimentary particles and oxygen, and carrying out refuse matter. The skeleton, which gives shape and substance to the mass of sarcode particles that constitutes the living animal is composed, in the sponges with which we are most familiar, of an irregular reticulation of fibres. Most sponges are strengthened by calcareous or siliceous spicules, and the variety of forms presented by these bodies is almost endless. In the ordinary sponge, *spongia officinalis,* the fibrous skeleton is almost entirely destitute of spicules; but in the curious and beautiful *dictyochalix pumiceus* of Barbadoes, the entire network of fibres is composed of silex, and is so transparent that it looks as if composed of spun glass.

With the exception of those that belong to the genus *Spongilla,* all known sponges are marine, but they differ very much in habit of growth; some are only found at considerable depths, others live near the surface, and many attach themselves to rocks and shells between the tide-marks. The average depth at which the best Turkey sponges are found is thirty fathoms; those of an inferior quality are found at lesser depths. B.

PHOTOGRAPHIC CHEMICALS.—I.

PHOTOGRAPHY has spread so wonderfully through the length and breadth of the land, that there is scarcely a hamlet or village too small or insignificant not to be visited at least occasionally by some of the votaries of the art. The quiet chemists of the picturesque townlets are now and then frightened from their propriety by the apparition of a mild gentleman in spectacles, with very black fingers and wristbands, who asks, in a very courteous, but excited manner, for a small quantity of pyrogallic acid, he having "unfortunately left his bottle behind him—" or, if there is no artistic "bit" in the neighbourhood, the questioner is very possibly a mountebank-looking party, in a velveteen coat, with no shirt collar, a closely shaven beard, and curly black hair, who asks for "two hounces of postiv clodion, nooly mixed." The poor chemist is aghast, he looks furtively in his Pharm. Lond. for 1833 for pyrogallic acid, and finds nothing but gallic acid, which the mild gentleman politely tells him will not do. As for the "postiv clodion," he supposes the man must mean collodion, and forthwith serves him with two ounces of it, in a fine ropy condition, which is shortly afterwards returned by the seedy "professional," with a few observations not remarkable for their elegance, or their friendliness to the chemist's eyes. The poor amateur is obliged to go away disappointed of his view, and the "professional" is prevented from taking a number of patent enamelled American ivory-type portraits of the Chloes and Strephons of the place, at 6*d.* each, frame and glass included.

To obviate these unpleasant little occurrences, we propose giving a list of chemicals which ought to be kept by every one of our subscribers, who has not already a well filled photographic corner in his shop. They are neither numerous nor expensive, and with one or two exceptions will keep for any length of time.

Before giving the list, we think it would be advisable to give the slightest possible sketch of the various processes employed. The science of photography treats of the method of impressing images upon substances by means of the chemical or actinic portion of the sunbeam. A sunbeam is composed of three rays, viz., the luminous, the calorific, and the chemical. The effects of the two former are too familiar to be noticed here, the effects of the latter are made manifest in the fading of colours, the bronzing of the complexion, the germination of seed, and the various photographic processes.

The principal photographic processes at present in use are the following :—1. The Daguerreotype. 2. The Talbotype, or Calotype. 3. The waxed paper. 4. The albumenised glass. 5. The positive, negative, and dry collodion processes. 6. The various paper printing processes.

1.—THE DAGUERREOTYPE PROCESS.

The Daguerreotype process was invented by M. Daguerre, a French savant of eminence, about the year 1839. The processs consists in submitting a plate of silver, or silvered copper, to the vapour of iodine and bromine in the dark, forming upon the surface of the plate a compound of iodide and bromide of silver sensitive to light. The sensitive plate is exposed to the image of an object in the camera obscura, which is latently impressed upon it, and which remains invisible until the plate is exposed to the vapour of mercury, when the image is gradually developed by the mercury fixing itself upon those parts of the sensitive layer which have been acted upon by the light. The amount of white deposit formed is in exact proportion to the strength of the light which has fallen from the different parts of the object, giving perfect gradation of light and shade from the purest white to the deepest black. The plate is dipped into a solution of hyposulphite of soda, which removes the unaltered iodide and bromide of silver. It is then washed and dried, and finally covered with a thin transparent film of gold by a solution of the chloride of that metal being poured over it ; it is once more washed and dried, and the picture is finished. Daguerreotypes are often coloured with powder colours, which, when done with artistic feeling, takes away much of the death-like character so much complained of. Daguerreotypes are but seldom taken now-a-days, although they are among the loveliest productions of the camera. They have been quite superseded by the easier, healthier, and less expensive Collodion process.

2.—THE TALBOTYPE, OR CALOTYPE.

This process was discovered by Mr. Fox Talbot, an English gentleman, in the year 1839—the same year in which Daguerre gave his discovery to the world. It was singular that two scientific men, who had no communication with each other, should make the discovery that iodide of silver possessed the property of receiving a latent impression, which might be developed by the application of another substance. A piece of paper is saturated with a solution of iodide of potassium, dried and laid on a bath of nitrate of silver. Iodide of silver is formed, and the paper is washed and dried. It is sensitised by being laid on a solution of nitrate of silver mixed with a certain proportion of gallic and acetic acid. It is dried, exposed to the image in the camera, and developed with a saturated solution of gallic acid, to which a few drops of aceto-nitrate of silver are added. The picture is washed, the unaltered iodide of silver is dissolved out by means of a saturated solution of hyposulphite of soda —"fixed" as it is technically termed. The hyposulphite is well washed out, the picture is dried once more and waxed to render it more transparent. The result is a negative, and is only fit for printing. As we shall frequently have occasion to speak of "positives" and "negatives," we may as well explain the meaning of the terms. A negative is a picture in which the lights and shadows are reversed; a positive is a picture in which the lights and shadows are as in nature. In the case of the Talbotype picture just described, the result is a negative, from the light acting as a blackening agent, in conjunction with the developer; whereas in the Daguerreotype, the sensitive layer has been bleached by the light and the mercury.

The waxed Talbotype is laid upon a piece of sensitive paper and exposed to the light. The light passing through the transparent shadows, and being intercepted by the opaque lights, reverses the negative and produces a positive. The process will be fully described when we come to positive printing. The picture obtained is soft and artistic, but in no way comparable with the results of the Collodion process for sensitiveness and delicacy of detail. It is consequently but seldom employed, a remark which will also apply to the following :—

3.—The Waxed Paper Process.

This is a useful modification of the Talbotype, introduced by M. Gustave le Grey. The paper is waxed before iodising, by which a very fine surface for the deposition of the sensitive iodide of silver is obtained. Although superior to the Calotype in fineness of detail, it is inferior to it in sensitiveness and simplicity. The manipulation, too, is much more difficult from first to last. In the hands of certain careful manipulators, it has been made to yield very fine results. It has been thought by many to be superior in convenience to the Collodion process for taking views in places not easily accessible, as only a small quantity of apparatus is wanted, but when we see Collodion pictures from Japan, Greenland, and Madagascar, the difficulty in transporting the necessary apparatus does not seem an insuperable one.

4.—The Albumen Process on Glass.

In this process glass is chosen as being the smoothest and most transparent vehicle for the deposition of the sensitive layer, and albumen as being a transparent hard substance, which would not in any way interfere with the detail of the picture. Albumen or pure white of egg is prepared by separating the yolk and germ from the white. It is diluted with a certain quantity of water, beaten into a froth, and allowed to settle. The clear liquid is carefully decanted, mixed with a portion of iodide of potassium, poured upon a clean glass plate, and dried spontaneously, or by artificial heat. This is the most troublesome part of the process, as the moist albumen is liable to attract dust in large quantities. The plates are rendered sensitive by immersion in aceto-nitrate of silver; they are then washed and dried, and may be kept a long time in an excited state. The exposure in the camera, from some cause or other, not yet explained, is extremely long. The development is effected by the use of gallo-nitrate of silver, with the addition of acetic acid. It usually requires more than an hour for this part of the process, but it may be accelerated by the application of heat. The prints from the negatives are remarkable for their great distinctness and wonderful elaboration of detail, but there is a hardness of outline, and an absence of gradation of tint, which renders them very unartistic in appearance. This defect, combined with its great slowness, renders this process unsuitable for taking pictures in the camera, but from the marvellous detail obtainable, it is much used for printing transparent stereoscopic slides. For this purpose, a Collodion negative, which is rather weak in its contrast of light and shade, is used, and the positive is printed on the albumen by direct superposition. The results obtained by this method by M.M. Ferrier and Clouzard are not to be surpassed by any known process of printing upon glass.

THE NATURAL ORDERS OF PLANTS.

RANUNCULACEÆ.—THE CROWFOOT, RANUNCULUS; OR BUTTERCUP ORDER.

THIS order, which is one of the most highly developed in the vegetable kingdom, belongs to the class Exogens (outward growers), and consists principally of herbaceous plants, but includes a few climbing shrubs, such as the Clematis. They are chiefly natives of cold, damp climates, and are rarely met with in the tropics, except on the sides and summits of mountains. Europe is stated by Lindley to contain more than one-fifth of the order; North America about one-seventh; South America only one-seventeenth; India one-twenty-fifth; and Africa very few species, except on the shores of the Mediterranean. De Candolle states, that eighteen species have been discovered in New Holland. According to Lindley, the order includes forty-one genera, and one thousand species. The order takes its name from that of one of its principal genera, Ranunculus. Withering is of opinion that this word, which is the diminutive of *Rana*, a frog, was probably chosen as the designation of the genus,—not because several species are met with in marshy places, the haunts of the familiar reptile, as the original of Dioscorides, *R. Asiaticus*, is always found in dry situations,—but because the divisions of the leaves bore a fancied resemblance to the frog's foot.

BOTANICAL CHARACTERS.—The leaves are opposite, or alternate, generally much divided, but sometimes entire; the petioles (leaf-stalks) are dilated at the base, and form a sheath half clasping the stem. Hairs, when present, are simple. The calyx (outer floral covering) consists of from three to six, generally five, distinct divisions (sepals); is either regular or irregular, green, or rarely petaloid (resembling petals), and deciduous. The corolla (inner floral covering) consists of from three to fifteen distinct divisions (petals), is either regular or irregular, and sometimes altogether absent. The plants of this order differ considerably from each other in the structure of their calyx and corolla, although in other respects they maintain a close resemblance. Thus in the genera Aconitum, Delphinium, &c., the flowers are very irregular, assuming the form of a hood or spurs. In others, these envelopes are so blended together, as to be undistinguishable, as in Anemone and Marsh Marygold (Caltha.) In some, only the calyx is present, as in Clematis; whilst in Ranunculus, both calyx and corolla are perfectly distinct. The stamens (male organs) are numerous, very rarely few, and hypogynous (situated below the female organ, and free from it and the calyx.) The carpels are numerous, one-celled, or united into a single many-celled pistil (female organ). The fruit is variable, consisting of a number of Achenia in the Ranunculus; of several follicles, in Aconitum, Helleborus, Pæonia, &c.; and of a one or more-seeded berry in Actæa. The seeds have a horny Albumen, and a minute embryo. The order is divided into five tribes, viz., *Clematideæ*, Ex. Clematis; *Anemoneæ*, Exs. Anemone, Thalictrum; *Ranunculeæ*, Ex. Ranunculus; *Helleboreæ*, Exs. Helleborus, Aquilegia, Pæonia, Aconitum; *Actæeæ*, Exs. Actæa, Podophyllum.

DIAGNOSIS.—We extract the following from Professor Bentley's excellent manual, thinking it may prove useful to a portion of our readers:—

"Herbs, or rarely shrubs, with a watery acrid juice. No stipules separate from the petiole. Sepals, petals, and stamens, distinct, hypogynous. Corolla with an imbricated æstivation. Anthers adnate bursting longitudinally. Carpels always more or less distinct. Seeds without an aril and with horny albumen, anatropal."

Lindley gives the following

DISTINCTIONS FROM ALLIED ORDERS.—*Dilleniaceæ*—By the want of an aril, a deciduous calyx, and whole habit. *Magnoliaceæ*—By the want of true stipules. *Papaveraceæ* and *Nymphaceæ*—By the distinct and concrete carpels; watery, not milky juice; and acrid and not narcotic properties. *Berberidaceæ*—By its stamens not bursting by recurved valves, *Rosaceæ*—By hypogynous, not perigynous stamens; want of true stipules, and acrid properties. *Umbelliferæ*—By its calyx being distinct from the ovary, and by its indefinite stamens.

GENERAL PROPERTIES.—The plants of this order must always be regarded with a degree of suspicion, as causticity, acridity, and poisonous properties, are their prevailing characteristics; but some species have these properties so slightly developed as to be harmless. The caustic principle, according to Krapfen, is of a very curious nature, so volatile, that simple drying, infusion in water, or boiling, is, in most cases, sufficient to dissipate it; it is neither acid nor alkaline, and is increased by acids, sugar, honey, wine, spirit, &c., and only effectually destroyed by water and vegetable acids. It varies in different parts of the same plant, and even in the same parts at different seasons. Some plants of the order are narcotic, and several of the species topical benumbers.

PRINCIPAL PLANTS AND USES.

ACONITUM.—Many species of this genus are virulent poisons, owing to the presence of the alkaloid *Aconitina.* The celebrated Indian poison "Bikh, or Bish," has generally been considered to be the produce of *A. Ferox*, a Nepal plant, said to contain more aconitina than any other species; but, according to Dr. Hooker, it is obtained indifferently from *A. napellus*' *luridum*, and *palmatum;* the former of these three is the officinal plant of the Ph. L., a brief notice of which will be found in our Botanical Calendar for February.* The root is intensely poisonous, and has unfortunately caused several deaths by being mistaken for that of horseradish. (A distinction of these two roots will be found in our Botanical Calendar for May, 1860.†) The root, or rhizome of *A. heterophyllum*, is said to be destitute of poisonous properties, and, according to Thompson, is greatly reputed in India as a febrifuge and antiperiodic.

ACTÆA.—The species *spicata*, Baneberry, which is indigenous, produces poisonous berries, which are said to yield a deep black dye; the roots are stated to be antispasmodic, expectorant, and astringent, and to have afforded relief in cases of catarrh. Similar properties are possessed by the species *Racemosa* (the *Cimicifugà racemosa* of American botanists), the root of which is regarded as a remedy for the bite of the rattlesnake.

CLEMATIS.—The leaves of the species *erecta* and *Flammula* have been used as rubefacients, and other species probably possess similar properties.

COPTIS.—The species *trifoliata*, or Gold Thread, is an American plant, which possesses pure and powerful bitter properties, and is used as a stomachic and tonic; and for apthous affections of the mouth in children. The root of the species *Teeta*, is met with in the bazaars of India, and known under the title of Mishmee bitter, or Mahmira; it is intensely bitter, and is stated to be a very powerful agent in the cure of fevers.

DELPHINIUM.—Stavesacre seeds, used for destroying vermin, are the produce of the species *Staphysagria.* They contain a peculiar alkaloid, *Delphinia*, which is sometimes employed externally in neuralgia and rheumatism.

HELLEBORUS.—The roots and rhizomes of the species *Officinalis* constituted the Black Hellebore of the ancients, and was employed as a drastic purgative. The species *Niger* is still occasionally employed in this country; other species possess similar properties, and may be used as efficient substitutes.

HYDRASTIS.—The root of the species *Canadensis,* a North American plant, has a strong narcotic smell, is very bitter, and is used as a tonic. It is termed "Yellow Root," and gives out a most beautiful yellow colour.

KNOWLTONIA.—The leaves of the species *Vesicatoria* are used as vesicatories in Southern Africa.

NIGELLA.—The seeds of the species *Sativa* were formerly employed instead of pepper. It is supposed that the "Black Cummin" of Scripture (Isaiah xxviii. 25—27) consisted of the seeds of this, or another species; it is used by the Affghans for flavouring curries.

PÆONIA.—The seeds of the species *Officinalis* are emetic and cathartic, and the root is said to be antispasmodic.

PODOPHYLLUM.—The species *Peltatum* is the May Apple, or Mandrake, of North America. An article on this plant will be found in our current number.

RANUNCULUS.—Many of the species of this genus are very acrid, particularly *Sceleratus* and *Flammula,* which are used in the Hebrides for producing blisters, which they are stated to effect in about one hour and a half; the wound produced is, however, difficult to heal, and apt to pass into irritable ulcers. Beggars are said to employ these plants, and also the leaves of some species of Clematis, to procure artificial ulcers. The thickened roots of the species *Ficaria* abound with starch, and have been employed as food. The species *Thora* is extremely acrid and poisonous; its juice is said to have been the poison used by the Swiss hunters to envenom their javelins. Balfour states that the species *sceleratus, alpestris, bulbosus, gramineus acris,* and *Flammula,* are acrid, while *repens, aquatilis, Lingua,* and *Ficaria,* are bland.

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* Vol. I. p. 99.

† Vol. I. p. 187.

XANTHORRHIZA.—The wood and bark of the species *Apiifolia*, and also a gum and resin procured from it, possess a pure bitter taste and tonic properties.

This order contributes many plants for the adornment of our gardens, as the different species of Clematis, Anemones, Larkspurs, Aconite or Monkshood, Ranunculus, Pæonies, &c. Fortune mentions a plant, "the tree pæony of China" (Moutan Officinalis), growing in the neighbourhood of Shanghae, which produced annually from 300 to 400 blossoms.

PODOPHYLLUM PELTATUM.

SYNONYMS.—Mandrake,* May Apple, Hog Apple, Wild Lemon.

HISTORY.—According to Dr. Keith, the medicinal properties of this American plant have probably been known to the Indians for ages; at all events, their Tla-quill-aughs have handed it down to the present generation of Indian Asclepiadœ, who use it in nearly all diseases requiring a cathartic. They employ it in the form of decoction, combined with tonic, carminative, or stimulating barks or roots, as the nature of the case seems to require. The root was also employed by the colonists, and has continued to be used to the present time; latterly, however, its employment has very much increased, in consequence of the discovery of its active principle, the fame of which as a medicinal agent has been recently attracting great attention in this country.

BOTANY.—It is an herbaceous plant, generally considered to belong to the natural order *Ranunculaceæ*—Crowfoots—but classed by some under the order "*Podophyllaceæ.*" It has a large perennial creeping root, an upright stem, bearing two large, lobed, peltate leaves, and a solitary white flower, springing from the axil of the leaves. The fruit is a berry about the size of an egg, which ripens in August and September, is of a light yellow colour, has a pleasant sub-acid taste, and possesses no cathartic properties; it is edible, but not agreeable. The leaves, stalks, and roots, in a fresh state, produce very unpleasant effects, in consequence of an acrid volatile substance which they contain, and which is dissipated on drying; they are stated by some authorities to be narcotic. The plant is common throughout the United States, being met with in moist woods, and shady places along the banks of rivulets.

CHEMISTRY.—Dr. E. Staples found it to contain resin, starch, and a peculiar vegetable substance, crystallizable in silky tufts. A peculiar principle was obtained from it by Mr. Hodgson, to which the term *podophyllin* was applied. Podophyllin is now largely prepared by Messrs. Tilden & Co., of New Lebanon, New York. It varies in colour, according to the mode of preparation, from a dark brown to a lemon yellow, is insoluble in acids, and precipitated from its solution by them. It is also insoluble in hot and cold water, either pure or acidulated. It is soluble in alkaline solutions, and entirely soluble in alcohol. When its alcoholic solution is evaporated to a syrupy consistence and mixed with water, the whole of the Podophyllin is precipitated, and the filtered liquid is colourless. The active constituents of the root vary in character and amount, at different seasons of the year. The bitter principle of the root is soluble in water. Podophyllin has a disagreeable, pungent taste, which extends over the throat and fauces. It possesses all the medicinal properties of the root in a highly concentrated form, and is much more convenient for administration; and since its introduction, the notoriety of the medicine has rapidly increased.

ADULTERATIONS.—Sugar of milk, salt, magnesia, and the powdered root, are used to adulterate Podophyllin. They may be detected by digestion in strong alcohol, when the Podophyllin is dissolved, and the impurities remain insoluble. The per centage of the pure alkaloid can be easily determined by washing the residue with alcohol, drying, and weighing.

MEDICINAL PROPERTIES.—Pereira says, in reference to the root, "It is an active cathartic, resembling jalap in its action upon the bowels. It stimulates the muciferous glands and exhalants, and occasions watery discharges, in too large doses giving rise to tormina. It is highly spoken of by many eminent writers who have tested its efficacy. Dr. Eberle says he very frequently gave it instead of jalap, and always found it active and safe in its operation. Dr. Burgon regarded it as slower in its operation than jalap, but as leaving the bowels longer in a lax condition. In bilious fevers and intermittents it has been much used throughout the

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* This plant, though familiarly known in the United States as the Mandrake, must not be confounded with the true Mandrake, *Mandragora Officinalis*, a plant belonging to the natural order *Solanaceæ*—Nightshades.

United States. Combination with calomel or bitartrate of potash increases the certainty of its action, and at the same time moderates its drastic effects. In large doses it occasions tormina and tenesmus, and hypercatharsis with mucous and bloody discharges; it also nauseates the stomach, and induces vomiting." In Tilden & Co.'s "Book of Formulæ" we find the following description: "It is a certain cathartic; in large doses an emetic, alterative, anthelmintic, hydragogue, and sialogogue. It rouses the liver to vigorous action, determines the blood to the surface, stimulates the kidneys, promotes expectoration, augments the glandular functions, and cleanses the alimentary canal of all irritating substances. In small doses it acts as a powerful alterative. Useful in scrofulous and syphilitic diseases, hepatic affections, dysmenorrhea, rheumatism, gonorrhea; also administered beneficially in jaundice, dropsies, dysentery, diarrhea, bilious, remittent and intermittent fevers, puerperal fever, typhoid fever, and all glandular enlargements. Its range of application is perhaps more extensive than any other carthartic medicine, and is indicated in all cases where the use of mercury is indicated."

PREPARATIONS and DOSES.—The following are mentioned by Tilden & Co. The proper doses are appended. Fluid Extract, ʒss to ʒj; Compound Fluid Extract, ʒj to ʒij; Solid Extract, grs. iij to grs. xij; Podophyllin, gr. $\frac{1}{8}$ to $\frac{1}{4}$, and gr. j to grs. iij; Tincture Podophyllin, ʒiss to ʒiv. The same writers give formulæ for various compound pills, containing podophyllin as a chief ingredient, and one for "Mandrake Compound," composed of mandrake, senna, and jalap.

THE BUSINESS OF A CHEMIST AND DRUGGIST.

COMMUNICATED BY "ONE IN THE TRADE." *

THAT the drug trade is now in an improving condition, is a fact which must be palpable to all connected with it. The spirit of enterprise and commercial activity which pervades and governs all our branches of industry, must, of necessity, also exert a beneficial influence on matters connected with our trade. Any and every thing that will tend to diminish sickness, and improve our condition, in a sanatory point of view, commands, in a greater or less degree, the attention of the suffering public. Hence the success of many of those commonly termed "quack medicines," which are constantly kept before the public eye by means of advertisements. Why do the proprietors of such spend the enormous sums of money, which many of them do, in making them known? Simply because they find that in proportion as they advertize and laud them, in the same ratio does their sale increase. I think, if we take the trouble to ascertain who are the principal purchasers of such articles, we shall find them to be working mechanics, artizans, and persons of that class, who, being imbued with a laudable desire to improve themselves, read the cheap periodicals and literature, in which care is taken that such advertisements should appear. Now, I do not for one moment intend to raise any objection to advertizing as the medium of making known useful medicines, for, on the contrary, I believe it to be the best and only medium whereby a large sale can be secured; but is it not the *business* of the Chemist and Druggist to study how the public can be best supplied with useful and safe "family medicines," without their being gulled into the purchase of those which, in consequence of their constant appearance in public print, are supposed by them to be what they really profess, nor do they discover their error until they have proved by experience the fallacy of their suppositions—to say nothing of the loss to them, in many cases, of hard-earned wages.

For my own part, I cannot coincide with many members of the trade, who deem it more judicious to fill the shop with fancy articles, supplied ready for sale, and offering a certain amount of profit, if sold, to the slower, but more steady, lasting, and legitimate mode of increasing trade by means of the preparation, and introduction, of medicines in such a form as to render them less nauseous, more concentrated, and purer, but equally efficacious. The arguments usually adduced against this are,—that it involves a great deal of valuable time; that experiments are not conducted without expense; that the manipulation attending many chemical compounds requires experience and tact, which all individuals do not possess; lastly and chiefly, that when prepared and submitted to the public, these preparations do not always "take." There is doubtless much truth in these arguments, but cannot the obstacles which present themselves be overcome? If the vendor of some quack medicine, who makes a "money transaction" of his *ne plus ultra*, can make it pay, surely an elegant and efficacious preparation, compounded by a respectable member of the trade, would soon establish itself, and command a steady and increasing sale. A wide field presents itself for investigation and research. The total number of compounds in our *Pharmacopœia Londinensis* amounts to upwards of 270.

If the reader doubt the practicability and remuneration that would be received by the adoption of such a scheme, let me ask such a one, how is it that those makers of valuable preparations which *are* known, can obtain the price they do for their respective articles? If instances are wanted take Squire's *Ext. Taraxaci*, Howard's *Sodæ sesqui*, Newbery & Sons' *James' Powder*, and last, but not least, Battley's *Preparations*. Why are the names of these individuals so frequently appended in prescriptions? Because they are known and recognized as makers of *superior* articles! Therefore the individual who makes it his study to produce the best preparation must inevitably, in the long run, succeed.

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* For a previous communication, see Vol. I. page 378.

Now that we have an organ circulating among the trade, and making known trade wants, we shall progress with increased rapidity. With the *Pharmaceutical Journal* assisting us in our scientific investigations, and the *Chemist and Druggist* aiding and assisting us in our every day pursuits, we may look forward to a new and bright era in the history of the drug trade. Knowledge will be diffused; the evils which exist will gradually be removed, and I feel assured, that in a few short years, the Chemist and Druggist will find something far more honourable, remunerative, and interesting, than in seeking to render his shop a storehouse of commodities, a vast number of which are totally foreign to the business he professes to pursue, and the interests of which he professes to advance. Medical men will become more communicative and entrusting; there will be less complaints as to medical practitioners dispensing medicines; in fact, science and pharmacy will then go hand in hand.

For the furtherance of these objects we must make ourselves acquainted with every particular—both in a medicinal and historical point of view—connected with the substances we vend. Our young men especially must give this matter their earnest attention. They may depend upon it that in future years their success in life will be mainly dependent upon the amount of knowledge and skill they acquire in their avocation. This brings me to an important topic,—viz., study; this subject has been the theme of much remark for a considerable period, and it must now be acknowledged that we are far from perfect on this point; the reason I believe to be this:—the study of drugs and chemicals is usually represented to those younger members as something very hard, very dull, very monotonous, and almost unprofitable in the end,—I speak not only from my own experience, but also from what others have remarked to me on the subject. Now, if such ideas have been conveyed to the mind of any individual, let me assure such a one that it is *not* so. The study of those substances derived from the vegetable kingdom, is especially very interesting, as experience will prove. As a body, I consider we do not give sufficient countenance to talent, as exhibited among the young men in the trade. If I might be allowed to make a suggestion on this subject it would be this;—That each member of the drug trade should forward, at a stated period, a voluntary contribution to some person who would consent to receive, and act as treasurer towards, a fund that should be appropriated thus:—

The money so collected to be divided into two, three, or more prizes, according to the amount received.

That such prizes be given to the person or persons who shall best make known, and produce the active principle of any given plant or plants, in such a form as to be fit for exhibition as medicines; that the process be made as simple and practicable as possible.

That preference be given to such articles as rhubarb, gentian, &c., and that contributions be accepted, of one shilling and upwards—other minutiæ to be arranged as circumstances may from time to time determine.

Should such a step be adopted, many would come forward and compete, and the talent which now lies inactive would be developed, to the advancement of pharmacy and the good of mankind. For my own part I am ready to co-operate in any way, and by every means in my power, towards the furtherance of this object, as I consider it would tend more to raise our status, and improve our condition, as members of society, than anything that has been brought forward of late.

To summarise:—The legitimate business of a Chemist and Druggist is to study how medical practitioners, and the public, can be supplied with drugs, chemicals, and chemical compounds. in the purest, most concentrated, and best form, and to avoid as much as possible trading in those articles, the sale of which belongs to *other trades*. As I may at a future period refer to some other matters connected with our trade, I will now bid the reader adieu, trusting my remarks may have proved interesting.

CÆSIUM.—This new metal has lately been added to the already long list of those substances. Cæsium was discovered by M.M. Bunsen and Kirchloff. These gentlemen found that certain lines contained in the spectum produced by burning chlorides in alcohol afforded a most delicate method of analysis. The rays and lines shown by the chlorides of the alkali metals are perfectly well defined, while those of barium, strontium, and calcium, are more complicated. Sodium shows a yellow ray, polanium a purple, and lithium a red ray, the absence or presence of either ray indicating the corresponding presence or absence of these metals. M.M. Bunsen found that in examining the products of the mineral waters of Krewznach, a new ray made its appearance, indicating the presence of a new metal. They have since proved the truth of their supposition by evaporating 20 tons of the water, which have yielded 250 grains of the platinum salt of the new metal.

THE MONTH

Poisonings.—A lad named R. Murton has been poisoned by eating pudding made of flour, which was on analysis found to contain arsenic in considerable quantities.—Eliza Sheen, aged 19, has died from the effects of cyanide of potassium. It was proved in evidence that the poison had been procured by a groom, in the name of a photographic artist. The jury, evidently under the impression that the new bill, which is "An Act to Amend the Law Relating to the Unlawful *Administering* of Poisons," was directed against their *sale*, returned the following verdict:—"We find that deceased died from the mortal effects of poison, but by whom administered there is no evidence to show. The jury cannot separate without publicly expressing their regret that no clause was introduced into the bill recently passed for the sale of poisons, to prevent the facilities which now exist for procuring (without license or restriction) such rapid and deadly poison as that which has caused the death of Eliza Sheen, and who, in the opinion of the jury, might have been now living had such restriction been placed upon its sale. Further, they beg to recommend to all chemists and druggists not to supply the poison but to persons only who are known to use the same for business purposes, or upon their written orders, whose signatures should be indisputable."—The *Journal de Pharmacie et de Chimie* of November reports fully the particulars of the poisoning, by fungi, of five officers at Corte, in October, 1859. These fungi, supposed to be the spurious Orange Agaric (*Agaricus muscarius* of Linnæus, *Amanita muscaria* of Greville), were eaten at breakfast. The invalids exhibited alternations of cerebral excitement and coma, and died in about a week.—A paper "On the prevention of accidental poisoning," by Mr. Julius Schweitzer, was read at the last meeting of the Pharmaceutical Society. The principal questions discussed in the paper were the following:—What is poison? Is it possible to prevent cases of accidental poisoning? Can we improve the present mode of keeping poisons? Can we insure the proper and safe mode of using poisonous remedies by the public?

An English Opium Eater.—The following is an extract from a letter of S. W. Hillier, who recently shot himself at Aldershot:—"I really believe I am poison proof. About ten days ago I took half an ounce of laudanum, enough to poison a horse. It had no effect on me. After that I took eight grains of opium; again no effect, except a slight drowsiness. Then four grains of morphia; no effect. I then took five grains of liquor opii. sedativus, with the same result. My last mode of exit is a sure one."

The Roman Bath.—Our Circular recently contained an article on the Turkish bath. We now learn that a company is being organized to re-establish the ancient Roman or hot-air bath. This description of bath is said to be an improvement on the so-called Turkish bath, and as the promoters intend to consult the opinions of the profession in regard to the temperature of the sudatorium, we may hope to hear no more of the injurious consequences which have arisen from the indiscriminate use of hot air raised to 150°, and even to 180° Fahr.

Extraordinary Longevity.—The obituary in *The Times* of New Year's-day records, in a long list, the deaths of seven ladies and five gentlemen, whose united ages amounted to 1031 years, being an average of eighty-five years and eleven months each. The eldest of these was a gentleman aged ninety-six; and the youngest, another aged seventy-eight.

The Great Paraffin Case.—This case, reported in our last, is, we are told, about to be carried before the higher courts. Meantime, we see by our advertising columns that Mr. Young has warned "parties selling paraffin oil, under whatever name, made in contravention of his patent, that they subject themselves to action of damages."—Mr. J. Austin has been fined five guineas for creating a nuisance by the stowage of paraffin oil.

Re John O. Wray.—This insolvent, who, under the cognomen of Dr. Henry, has traded as a vendor of patent medicines of a peculiar character, has appeared again in the Insolvent Debtors' Court. Mr. Commissioner Nicholls adjourned the case *sine die.*

Professor Faraday's Lectures.—At the Royal Institution Professor Faraday is now delivering a course of highly-interesting lectures "On the Chemical History of a Candle." We shall notice these lectures at length on the completion of the course.

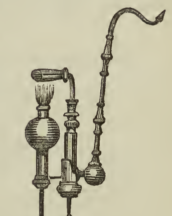
Drug Robberies.—Messrs. Horner, the wholesale druggists, have discovered that one of their confidential *employés* has been robbing them. A fellow-workman, whose suspicions had been aroused, detected him with some ipecacuanha in his possession, and at once gave him in charge. At the examination, it was stated that the members of the drug trade were robbed to the extent of thousands a year, and our own information fully corroborates the statement. We lately reported a similar case, and scarcely a day passes without the appearance in the police reports of robberies by those whose duty it is to protect their employers' property. This kind of dishonesty is too evidently on the increase. If so many cases are discovered, how many are there that never come to light?

COD-LIVER OIL PILLS.

MORE than once during the past year we have had occasion to reply to requests for a formula for Cod-Liver Oil pills, that no such formula existed, adding in our last reply that we understood a patent was being taken out for something of the kind. We are happy to be able to announce to the profession, that this problem, which has for a long time fruitlessly engaged the attention of pharmacists, has been definitively solved, and Cod-Liver Oil may now be exhibited in a tasteless, inodorous, and *solid* form. Physicians are sometimes backward in prescribing Cod-Liver Oil as a remedy for the rusty and often immovable mechanism of the human lock, on account of the natural repugnance shown by patients to its taste, odour, and oily nature. Numerous messes have been invented and described for doing away with its nauseous qualities; indeed, one person who used to advertise, in various journals, a method of rendering Cod-Liver Oil palatable, must have made a small fortune in postage stamps, to judge from the number of times his advertisement made its appearance. We have been favoured by an eminent French pharmacist with a specimen of Cod-Liver Oil pills, in which the chemical and curative principles of this medicine are contained in a concentrated form. They have the appearance of a small chocolate *bon-bon*, and, being tasteless and inodorous, may be kept in the mouth before swallowing without any unpleasant result. We are at present unauthorised to state the exact composition of these pills, and must confine ourselves to mentioning, that from the chemical analyses and medical experiments to which they have been submitted, their efficacy has been fully proved. The inventor deserves the gratitude of all who are condemned to take this disagreeable, but precious remedy. The manufacture of the extract has proved quite successful in France, and will be immediately commenced in this country. The invention is, of course, patented.

CHARTROULE'S IODOMETER AND IODIZED CIGARETTES.

Dr. Paul Chartroule, of Paris, has recently taken out a patent for new iodine-inhaling apparatus and means for the treatment of scrofulous, chest, and other diseases. He proposes to administer the vapour of iodine by the use of an ingenious little apparatus, called an iodometer, or by means of iodized cigarettes. The annexed engraving shows the inhaling apparatus, which is exceedingly simple, and which comprises in a small compass all the necessary requirements for maintaining the iodine-vapour at an invariable temperature. It consists of two distinct parts,—namely, a spirit lamp, and a retort or pipe, in which the iodine is vaporized; these two parts are connected by a metal arm. The apparatus being arranged, as represented, is supplied with a small quantity of iodine, and the lamp is lighted. The mouthpiece of the tube is then to be held between the lips, and the vapour is to be inhaled, as when smoking tobacco in an ordinary pipe. To iodize cigarettes it is simply necessary to mix a salt of iodine with the tobacco which is used in making them. The iodized cigarettes are smoked like ordinary cigars.



DAHLKE'S FILTER FOR CHEMICAL LIQUIDS.

The filtering medium patented by Mr. Dahlke was noticed by us at considerable length in a former number.* We are glad to learn that the favourable estimate we expressed respecting its value is likely to be brought to a very extended trial, Mr. Dahlke having organized a company for the purpose of working out the patent to the fullest extent. The managers have already received orders to fit up the whole of the General Post Office with filters similar to those supplied to the Drinking Fountain Association.

But our immediate object is an ingenious adaptation of the material to the purification of chemical liquids, for which it is more especially adapted, as being composed of silica and carbon, it is unacted upon by any ordinary re-agents; and possessing the capability of being made of any required porosity, it can be used in filtering to any required degree of mechanical purity. In ordinary cases, a separate filter is required for each liquid that has to be purified, entailing a necessity for a considerable number of filters. The inconvenience, which is very great when many liquids have to be dealt with, is entirely obviated by the ingenuity of Mr. Dahlke; as he has devised a plan, shewn in the annexed engraving, by which one filter will answer for a considerable number of liquids; all that is requisite being to remove the block of silicated carbon and replace it by a second, or even by another filtering substance.

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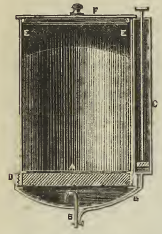
* Vol. I. p. 313.



Thus one block of the filtering medium can be kept for each liquid, or for each class of liquids; and, hence, used with economy, and without the chance of contaminating a simple medicine with any other of a poisonous or acrid character.

To produce rapid action a syphon, B, is employed, which is brought into action by means of a syringe, C, attached to it and the vessel. Therefore, neither quantity nor weight of the liquid to be filtered will have any influence on the rapidity of the filtration.

The lower part of the vessel by being screwed into the upper part, as shewn by D, fixes the solid filtering medium, which arrangement allows us to change the latter as often as may be required, and, thus, special filter blocks can be kept for certain valuable liquids.

The apparatus is supplied with a lid, F, to prevent evaporation.

We regard this as one of the most ingenious and practical improvements that have been made for filters for some time, and doubt not that it will come into very general use.

NEW GALVANIC BATTERY.

Professor Julius Thomsen has communicated to Poggendorff's *Annalen* a description of the constant copper-carbon battery which he has lately used in his electro-chemical investigations. As this battery is essentially a novelty, and as it will probably supersede many of the galvanic combinations now employed in the arts, a brief notice of its peculiar construction will not be out of place here.

In the ordinary galvanic apparatus zinc usually officiates as the positive element. This metal is, however, readily attacked by acid if it is not either chemically pure, or well amalgamated. If the sulphuric acid is not greatly diluted, the zinc cylinders are strongly attacked, even when the circuit is broken, in spite of the amalgamation, by which a great loss of metal is caused; if, on the other hand, the acid is much diluted, it is soon saturated, and the action of the apparatus is enfeebled.

There is no zinc in the apparatus invented by Professor Thomsen. The positive element is *copper*, in dilute sulphuric acid (1 part acid and 4 parts water); and the negative element is *carbon*, in the mixture of bichromate of potass, sulphuric acid, and water, recommended by Wöhler and Buff (100 parts of water, 12 of bichromate, and 25 of acid). The electro motive force of this novel combination is $\frac{9}{10}$ths of that of Daniell's battery. Its advantages are as follows:—The copper is not at all attacked by the acid when the circuit is open; the resistance of the sulphuric acid, from its being so little diluted, is a minimum; and the sulphuric acid is so strong that it can be used for months without becoming saturated. Moreover, as the mixture of bichromate of potass and sulphuric acid is inodorous, this combination is very convenient for working with in closed spaces. Theoretically, the combination is particularly interesting; for as copper cannot decompose dilute sulphuric acid, the copper-carbon battery is an example of a powerful apparatus in which chemical action and the disengagement of electricity are quite inseparable.

SUGAR-COATED PILLS.

THE practice of covering pills with sugar, which has been many years in use,* is being brought prominently before the public by the advertisements of Dr. Buchan's sugar-coated pills. Thinking that there might be something of interest to our readers in this matter, we have obtained a copy of the specification of the medicines, and hasten to give them and the patentee the benefit of such an extended publicity as our columns afford.

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* The practice of covering pills with sugar is usually and more efficiently performed by the confectioner. Should our readers like to try the plan on a small scale, we give the following directions, quoted from Mohr and Redwood's Practical Pharmacy:—"The pills are put into a hemispherical metallic pan, which is slightly warmed, and a small quantity of a solution of one part of gum; two parts of water is added, so as to moisten the surface of the pills; some powdered sugar is then sprinkled over them, and by moving the pan they are thus covered with a coating of sugar. They are subsequently placed on a sieve, and exposed in a warm room till they become dry. If a thicker coating be required, the process is repeated.

The "Improvements in Pills," for which this patent is granted, relate to the combination of the materials subjoined, in about the proportions given, and to coloring the sugar-coating, rose pink.

"To compound the pills, I take," says the patentee, "two ounces of gum gambogia, one ounce of pulv. rhoci optimus, one ounce of gum myrrh, one ounce of sapo Castile, one ounce of pulv. aloes Soce, one ounce of lingib. optimus, one ounce of sum cardium. I mix these ingredients with syrup, or other suitable matter, to form a mass." . . . We really cannot but sympathise with the ghost of the old author of the sometime celebrated but now somewhat antiquated "Domestic Medicine;" for if ever, like Hamlet's father, he "revisits the glimpses of the moon," he will see the walls pasted over with a very ill-favoured countenance which, we we presume, is intended for his likeness, unless it be that of the patentee; and he will find his reputation as a mild and gentle practitioner somewhat imperilled, by being put forth as the author of a purge of which the violently drastic and scouring remedy, gamboge, constitutes the active ingredient, a remedy particularly unsuitable to habitual use. As to the other ingredients in these invaluable pills, we must plead ignorance as our excuse for not describing them more fully. We have laboured for a quarter of a century in the profession, but really do not know that we ever before met with "pulv. rhoci," or even "lingib," and cannot say that we are familiar with the properties of the mysterious drug "sum cardium."

Correspondence

PHARMACY IN THE UNITED STATES.

From our Correspondent in Philadelphia.

My previous letters have been chiefly occupied with the organizations of pharmaceutists and the pharmaceutical colleges in "the States;" I now proceed to some observations in regard to the manufacture of chemicals, and so called "pharmaceuticals," the arrangement and management of the stores, and the practice of pharmacy generally. Of course, there is no uniformity in the latter particulars, in the widely different localities included in our view, but certain common characteristics are pretty generally observable among the Atlantic cities, these are modified by the customs of the Great West, and are almost obliterated when you reach New Orleans, where pharmacy and everything else is strongly tinctured with French ideas and customs.

The manufacture, on a large scale, of the preparations used in medicine is carried on chiefly in the cities of Philadelphia, New York, Boston, Baltimore, Cincinnati, and Louisville, Ky. Philadelphia enjoys the pre-eminence in this department, furnishing to commerce, perhaps, as much as all the other places combined. Two factories in this city are of enormous size, and embrace in their list a great variety of chemicals, including all the leading articles, such as sulphate of quinine and morphia; strychnia (employed in immense quantities in the West for the destruction of wolves, and animals killed for their skins); calomels, and all the mercurials; chloroform, and the other ethers; santonen, piperin, and many of that class of principles; all the salts of iron, zinc, antimony, and bismuth in common use; tannic and gallic, and other organic acids; and, in fact, the medicinal chemicals generally. We have also numerous manufacturing establishments of varying extent, some rising to the dignity of first-class, which are devoted chiefly to few special chemicals, with a more or less extended list of incidental ones, and new remedies not yet adopted by the chief houses. It would, perhaps, be invidious to name any of these without giving a catalogue of all, which would possess but little interest to your readers. The manufacture of glycerin has been brought to great perfection by a Mr. Bowers, of this city, who competes in quality with Price's Candle Company, and with the aid of the tariff competes with them in price. Our chloroform, as produced by several makers, is quite up to the Edinburgh standard, and at a greatly reduced price. As the cost regulates every thing in trade and manufacturing, it follows that numerous chemicals are invariably brought from England or France, and sold by our manufacturers in preference to making them here. Iodine and iodide of potassium come under this classification: these important articles of commerce are, by the way, very cheap in comparison to what they were some years ago; they are so largely imported and so "close,' that they fluctuate exactly with the changes in the London price. The same is true of numerous leading chemicals, which, though largely manufactured here, are also imported: sal-soda, bicarbonate of soda, carbonate of magnesia, sulphate of magnesia, sulphate and carbonate of ammonia, are instances of this class.

The mineral acids, sulphuric, nitric, and muriatic, and some of the vegetable acids, such as acetic and tartaric, are very largely made, not only in this city, but in various manufacturing districts throughout the Northern States; the same is true of acetate of lead and carbonate, or white lead, and white zinc, of which there are numerous makers, especially in Philadelphia. I have given these details to give your readers an idea of the amount of capital and energy expended in the various branches of chemical manufacture; but it must not be supposed that the chemicals used in dyeing and in the arts generally are produced here in variety or quantity to compare with the great English laboratories.

America is yet in the youthful stage in which many ill-advised schemes of manufacturing are entered upon to be followed by disastrous failure; the unsettled policy of our Government in regard to duties on imported articles has aggravated this evil. Your readers may not be aware that the main source of revenue of our Government is in duties on importation; we have no excise upon our home manufactures of any kind, nor any drawbacks on exportations. Those who advocate the "Protective" policy desire these duties to be high on all articles that can be successfully produced at home, and low upon all raw materials used in manufacturing; while their opponents, the free traders, who find their chief support in the Southern States that produce cotton and little else, are favourable to low duties, and the encouragement of importations. The interests of Great Britain incline to the latter policy, and have always induced a line of diplomacy calculated to weaken our rising manufactures. The whole subject is one of great complexity, and perhaps is chiefly important to our manufactures from the liability to such fluctuations with every change of Government as would impair the profits of business, and even sink the capital invested; in any event, we must continue for many years to import largely of chemicals and pharmaceutical wares from your old and well established laboratories.

PHARMACY IN PARIS.

FROM OUR OWN CORRESPONDENT.

AN endeavour was made in my last* to bring before your readers the spirit of one of the Associations here. The French are celebrated for their power of organization, and succeed admirably, whether it be in the promotion of a *queue* at a theatre, or of a national insurrection, the production of both which phenomena may be described as specialités of this people; for, as Carlyle (in his "History of the French Revolution") observes of the former practice:—"In time we shall see it perfected by practice to the rank almost of an art; and the art, or quasi-art, or standing in tail, become one of the characteristics of the Parisian people, distinguishing them from all other peoples whatsoever." The promoters of the United Society will therefore, without doubt, find amongst the rules of the Paris Society many useful hints. Indeed, in the writer's humble opinion, these rules—if the granting of prizes be excepted—may be adopted almost *en masse.* The distribution of prizes appears to be the only point on which a difference of opinion exists amongst its members; and with the Pharmaceutical Society devoting itself to the instruction, &c., of the body, the new Society will, I opine, do well to avoid any action of that kind.

I omitted mentioning in my former letter that, although not embodied in their rules, the members of the Paris Provident Society of Pharmaceutists have an annual dinner, which tends to bring together its members, and seems to give very satisfactory results. Public dining is much more an English than a French custom. It therefore scarcely admits of a doubt that what answers well in Paris will answer better in London. I would suggest the consideration of this to the promoters of the new Society; for, again to quote Carlyle—"Dinners are defined as the ultimate act of communion; men that can have communion in nothing else can sympathetically eat together—can still rise to some glow of brotherhood over food and wine."

I purpose now passing on to the other Institutions connected with Pharmacy here.—*The Ecole de Pharmacie.* There are ten professors attached to this School of Pharmacy, who lecture on pharmacy, chemistry, natural history, and botany. No apothecary can practise until he has passed an examination here. It contains a cabinet of specimens of all kinds of drugs, with a select mineralogical collection, also a small but select library. Attached to it is a botanical garden, which was the first ever established in France, and dates back as far as 1580. The medicinal plants that will bear the climate are here cultivated and classified. It will be apropos to add here, that, at the *Jardin des Plantes,* there is a botanical gallery which contains, among other interesting objects, a collection of drugs.

From the foregoing it will be seen that—subject to the national differences—France has its Pharmaceutical Society, and its Association for trade purposes. Both work most amicably and advantageously together for the common weal of the profession. Why should not England "go and do likewise?"

Time did not permit my examining very particularly into minor matters. I may, however, mention that no chemist is permitted to dispense any prescription containing dangerous ingredients without the written authority of a physician. The penalty for so doing is ruinous. Also, that no chemist is permitted to have more than one establishment. In reference to which last I may add, that one of the fraternity has just received 4,000*l.* indemnity for the demolition of his premises, which were required to make room for the improvements in the Boulevard de Sebastopol.

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* See vol. I. p. 410.

Observing in your columns continued reference to the uniform arrangement of prices, I enquired whether the experiment had been tried in Paris. It has been tried, and *L'Officine*, the standard work here on Pharmacy, contains a tariff, but alas! it is a dead letter. Here, as elsewhere, nothing but positive legal enactment could produce uniformity of charges; and although a tariff is nominally agreed to by the trade, practically each member follows his own devices. I think, therefore, it may safely be presumed that if it will not work here, there is no hope for it in England. Here everybody and everything is cared for, arranged, wrapped in swaddling clothes. The people expect it, like it, are used to it, and yet this uniformity of prices cannot be compassed. A chemist's shop here has a very different appearance to one in London. Our Parisian confines himself strictly to the dispensing of medicines. It is quite *infra dig.* to sell brushes, perfumery, &c. The French, we know, produce some of the very best chemists, and their laboratories are very superior to ours.

Homœopathic seem almost as numerous as Allopathic chemists here, and I am told the former practice is rapidly on the increase. No one seems able to predict the exact result of the new tariff on drugs and chemicals, but a considerable result seem to be anticipated.

To the Editor of the "Chemist and Druggist."

THE NEW PHARMACOPŒIA.

Sir,—Many months have now elapsed since anything connected with this, to us, all important subject has been made known. The *Lancet*, the *Pharmaceutical Journal*, and the columns of the *Chemist and Druggist*, are all silent on the matter. When the revision is to be publicly announced, or as to the progress of such a revision, we are as a body totally ignorant. Is it suddenly to appear among us like an actor in some favourite piece, or is it to be publicly announced in the columns of some leading periodical, and therein discussed, prior to its admission into the pages of that volume which is to be our guide and instructor for some few years to come? If the differences which now exist between the three Colleges can be, and are now being, brought to a satisfactory result, how is it that we are left in ignorance as to the doings of those in whose care it is entrusted? There surely can be no one among our ranks who is not willing to admit that the present "P. L." contains many imperfections; that many preparations are still retained as "officinal," which indeed have been long since superseded, and which ought not, in the present day, to occupy that high position they now enjoy. Of course I am speaking of Phillips's translation of the *Pharmacopœia Londonensis;* this being generally considered *the* Pharmacopœia translation. Nevan's gives us much more information under some heads, though it is not so generally used; in fact, to do the author justice, it is fuller, more comprehensive, and more concise in many things. With the merits or demerits of respective authors and their works I have nothing whatever to do. I only express, not only my own surprise, but that of several of my own denomination, that nothing, absolutely nothing, has yet publicly transpired relative to the forthcoming Pharmacopœia. Doctors, surgeons, pharmaceutists, manufacturing chemists, and druggists, all appear equally ignorant as to when it will make its appearance. The question has been put to me by members of the medical profession, who appear surprised that a dispenser should not be aware as to the changes which are likely to take place; and who suppose, that though the *Lancet* is silent, the *Pharmaceutical*, or some other journal, would record the progress of, and deliberations on, those subjects which have particular reference to the question at issue.

I have waited for some abler pen to introduce the subject, but finding no one come forward, I have taken up mine, hoping that if no good, at least no harm would arise, and that perhaps some suggestion that an individual like myself could make might be taken up, and receive an amount of attention which might otherwise be overlooked in the deliberations on some complicated theoretical portion of a new work. Having brought the subject into public notice by means of your truly valuable and widely-circulating periodical, I will not now trouble the reader's patience, but will reserve for a future period any suggestion I might wish to make. Apologising for my intrusion thus far on your valuable space, but feeling the subject to be one of moment to ourselves,

I have the honour to be, Sir,
Yours, &c.,

December, 1860. A DISPENSER.

A DRUGGIST'S SUNDRY THOUGHTS—A PHARMACEUTIST'S UTOPIA.

Sir,—The arguments of a writer published under the former heading in one of your contemporaries have been so completely met by your able rejoinder, under the latter title, that the general subject would seem perfectly exhausted. Nevertheless, as our firm is unmistakably alluded to by the author of "A Druggist's Sundry Thoughts" in an *incidental* form, and as a portion of your Journal is devoted to the expression of private opinions, we trust you will spare us space for the following remarks.

In the essay deprecating the traffic in sundries by Chemists and Druggists, the writer speaks of an entirely new branch of chemistry, which he designates "*Morganic*." Had he thought proper to spell the newly-coined word "*Mawganic*," we should have left another member of the Sundry trade to deal with him.

Mr. Joseph Ince, the writer of the clever, but somewhat illogical article to which we refer, seems to regard the union of a trade in sundries with the practice of Pharmacy as an illegitimate connection, or at best as a sort of *Morganatic* marriage. He, a strict pharmaceutist, tries to convince his readers that Pharmacy ought to be their sole occupation—that there is nothing like leather, in fact, and that they ought to stick to their last. Now, without giving an opinion upon the desirability of separating the sale of sundries from Pharmacy proper—a subject which has been so ably dealt with by your editorial pen—we, as traders, can honestly declare that we should be only too glad if Chemists and Druggists would follow Mr. Ince's advice. In many ways this change would benefit us. The articles sold would still be retailed by some one, and instead of sending, say six small parcels to one town, but one or two large ones would be sent. Again, Druggists' sundrymen are greatly annoyed at present by the way in which they are treated by some of the wholesale chemists, who seem to regard commercial morality as a stumbling-block in their path, to be steered clear of and avoided, if possible. Our name, like that of the other dealer in sundries, is pretty well known abroad. Our manufactures are often ordered through the wholesale druggists, who do not hesitate to execute the orders with their own or purchased articles—imitations of the Morganic goods ordered.

In conclusion, permit us to suggest that wholesale Druggists will do well to ponder over Mr. Ince's article. By "sticking to their last," they might do the trade generally some service. If the Chemists and Druggists confined their operations to Pharmacy proper, their wholesale brethren would not be tempted to commit this breach of honesty, which, it is to be regretted, has of late become so general.

Yours truly,
MORGAN BROTHERS.

NEWCASTLE AND GATESHEAD PHARMACEUTICAL ASSOCIATION.

Sir,—Please state in the next number of the "Chemist and Druggist" that your Almanac is in error as to the President of the Newcastle and Gateshead Pharmaceutical Association. Mr. William Proctor very worthily (as our oldest Pharmaceutist) holds that office. I have merely acted as Secretary. Tho' not a matter of much importance; perhaps it is better to be correct.

Yours, &c.,
HENRY B. BRADY.

To the Publisher of the "Chemist and Druggist."

Cambridge.

Much to my surprise I this morning alighted on the 16th number of your journal. When I applied for it a few months since, the reply sent was, "Discontinued." Will you oblige by forwarding it to me regularly, and (if you can) explain why my bookseller was unable to obtain it.

[The above was of course not intended for publication, but as the Publisher is continually receiving letters of a similar tenour, he wishes to explain that, in accordance with our plan of supplying the TRADE ONLY, booksellers' orders are never executed unless they can guarantee the copies getting into proper hands. A plan to remedy this complaint is submitted among the notices on our first page.]

NOTES AND QUERIES

PIL. COCHIÆ.—Mr. Joseph Thorp, of Grantham, says that the following is an excellent recipe, which he has used for a great number of years :—℞ pulv. aloes socat, lbss.; pulv. aloes cape lbss.; pulv. rad. jalapæ, ℥iv; pulv. gambogiæ, ℥iij; pulv. colocynth, ℥iv; pulv. sapon. Castil, ℥iv; ol. caryoph. ℥ss; syr. rhamin, q.s. usft. pill mass.

SULPHATE OF MANGANESE.—Can any of our readers inform J. T. where he can procure this salt in quantity, what is its price, and what are the purposes for which it is generally used?

COCCUS.—Can any of our readers give I. J. a correct recipe for any preparation from coccus that will not decompose with benzoic acid in solution with oxymel scilla.

LYCOPODIUM, AS A POWDER TO ROLL PILLS IN.—What is the best powder, or compound of powders, uniformly to be used in rolling pills, not required to be masked or coated with sugar, gelatine, or other substances? This question has been recently answered by a writer in the "American Journal of Pharmacy," who states that all inodorous pills are best rolled in Lycopodium, because this powder being very light, extremely fine and smooth, gives the pills a uniform appearance, and its tasteless and inodorous property is very desirable. Where the bitterness of a pill will be objected to by the palate, it is well to roll them in a mixture of one part of powdered liquorice-root, to two parts of Lycopodium, which will also give an even surface or coating to the pill, while its taste will be somewhat disguised. For quinine pills, however, finely sifted arrow-root ought to be employed, as it preserves their original white colour.

CHLORODYNE.—Mr. John Butterworth, of Boston, Mass., states that he tried to produce Chlorodyne from Dr. Ogden's formula, published in our February number last year, but with unsatisfactory results. He then substituted acetate of morphia for the muriate, and obtained a perfect compound.

Pyroligneous Ether.—W. F. Perhaps the respectable, but, we fear, rather ignorant firm mentioned by you may recognise the above spirit under some of the following synonyms:—Pyroxylic spirit, wood naphtha, methylic spirit, hydrated oxide of methyle.

Preston Salts.—"Chemist." Powdered carbonate of ammonia is moistened with strong liquor ammoniæ, and some volatile oil is added as a scent, according to fancy. The price list desired will be sent in a day or two.

Books for Beginners.—"Chemicus." The best working book on chemistry is "Fownes' Manual," John Churchill, New Burlington-street. We cannot give an opinion on the merits of any medical works. Write to the *Lancet* or *Medical Times*.

Magenta Dye.—A. C. The processes for manufacturing this dye are patented, and two long for description here. It is obtained from aniline, a product of the distillation of coal-tar. We intend publishing an article shortly on the aniline series of dyes, which will contain all the known information on the subject.

Mist. Bismuthi Comp.—"A Country Druggist." This is a new preparation, and is not to be found in any Pharmacopœia at present published.

Meerschaum-washed Pipes.—J. H. A correspondent informs us that these pipes are dipped in a strong alcoholic solution of gum benzoin. The clay absorbs the gum, which decomposes, and turns brown on the application of heat.

Our Price Current.—P.L., who is "informed by his drug-house that the Price Current issued by us is unreliable," is *informed* by us that it is *perfectly* accurate. At the commencement of this journal, it was the custom of the wholesale druggists to run it down, and pooh-pooh its lists. Finding these tactics useless and harmless, we presumed they had abandoned them. All we conceive it necessary to say to P.L., and others whom it may concern is, that our Price Current and Trade Report are furnished by one of the highest authorities on such matters in the City. They are prepared specially for us, and we guarantee their correctness. Such being the case, P.L.'s drug merchants', or, more probably, bagman's statement, can only be characterized by one of the shortest words in the English language—that ugly word of three letters, which we need not print. It is an entire and unmitigated falsehood.

[Owing to the unavoidable press of matter, consequent on the commencement of our new series, we must beg the indulgence of several of our correspondents, whose queries must necessarily remain unanswered until next month].

NOTE ON THE PROGRESS OF PHARMACEUTICAL CHEMISTRY*.

In view of the great increase of the variety of chemical substances used in medicine, the reflection is suggested that chemistry and pharmacy are so closely allied as that the progress of the former is inseparably connected with the extension and usefulness of the latter.

Since pharmacy was elevated to a distinct and separate pursuit, it has experienced a steady advance towards the rank of a science.

So far as reliable history goes, the Arabs appear to have been the first nation who had pharmaceutical establishments distinct from the vocation of the physician. In their conquering march westward over the North of Africa and the South of Europe, they exercised an important influence on pharmaceutical regulations. The medicinal preparations of those times were, however, mostly derived from the vegetable and animal kingdoms, and made by the processes of distillation, infusion, decoction, and preserving by sugar and honey.

In the eleventh century, the first apothecary store in Christian Europe was established in Salerno, in Italy, and from that time they have gradually extended among all intelligent nations, till apothecaries are now found in all sections of the world whose inhabitants can lay claim to civilization.

The introduction by Paracelsus of strictly chemical compounds as remedial agents opened to pharmaceutists the new path for scientific investigation in which they have since done so much, and from that time there have been many devotees to medicine and pharmacy who have distinguished themselves in chemical science.

The names of Scheele, Klaproth, Vauquelin, Proust, Derosne, Serturner, Liebig, and Pelletier attest the zeal of pharmaceutists, while Bœrhaave, Berzelius, Joseph Black, Humphrey Davy, Fourcroy, Berthollet, Wœhler, and many others, adorn the roll of the more strictly medical profession.

To the present generation of pharmaceutists the science is transmitted in greatly improved form. The modern pharmacopœias are robbed of much of their empiricism, and chemicals of definite composition are gradually replacing the crude and unscientific mixtures formerly prescribed.

It remains for us to repay the debt we owe to the past by zealous efforts to add still further to our science for the future.

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* This article is extracted from the new edition of Parrish's *Practical Pharmacy*, a review of which has already appeared in this Journal (Vol. I. p. 259).

TRADE REPORT.

THE Money Market has been in a very disturbed state since our last, owing to the great demand for America and France. The Bank rate, which, at the date of our last, was 5 per cent., was advanced to 6 per cent. on the 31st December, and again to 7 per cent. on the 7th instant. This event, as might naturally be expected, has produced great depression in all departments of business, and the transactions have necessarily been confined to mere retail sales, at generally lower prices. Consols for money closed this evening at 91⅝ ¾, and 91⅞ 92 for the account.

The dealings in chemicals have been unimportant. A few lots of tartaric acid have been sold 1/11¾, cask, the quotation of 2/ being now nominal; citric is very quiet at 2/1 and 2/1½; oxalic is held for 8¾*d.* and 9*d.* Soda ash is 2⅛*d.* and 2⅜*d.*, according to quality. Iodine is to be had at 5¼*d.* for No. 1 Hughcs', and 4¾*d.* and 5*d.* for seconds. Prussiate of potass is dull at 1/2½, and bichromate at 10¾*d.* Flour of Brimstone has sold to some extent for delivery up to March at 16/ and 16/6. Fine French cream of tartars are dull at 137/6. Montreal pot ashes 30/6 and pearl 31/6.

In the Drug market the chief feature has been large sales of Japan galls, which sold at 36/ and 41/, being 7/ and 8/ lower; a few good China realized 45/ and 46/. Shellac has declined about 20/, and prices are now almost nominal. Cubebs have declined, and owing to large arrivals, are expected to go lower. Oil of Aniseed has been sold at 7/4 and 7/5, and cassia is quiet at 10/9. About 80 bales common Bombay senna sold at 1¾*d.* and 2½*d.* A good quantity of Penang isinglass sold at steady prices. No sales in castor oil. A large sale of Japan wax sold at 2/ and 3/ lower prices; block 57/ and 59/, and Sanar 64/ and 65/; bees' wax is scarce, and rather dearer. Jalap is 2*d.* and 3*d.* lower; sales made at 4/6 and 4/8. A few cases citronnell oil sold at 5*d.*, and lemon grass 6¼*d.* Gums are without change, few parcels offered; kowric, however, is lower. Linseed oil is now 28/3, and rather more doing; fine French refined rape is 44/6 and 45/. Spirits of turpentine is easier, 31/ for American and 30/ for English. American spermaceti taken in 1/4. The fortnightly Drug Sales are fixed for Thursday next, when some large parcels of bark, gums, castor oil, and China rhubarb will be offered.

PRICE CURRENT.

☞ *These quotations are the latest for* ACTUAL SALES *in Mincing Lane. It will be necessary for our retail subscribers to bear in mind that they cannot, as a rule, purchase at the prices quoted, inasmuch as these are the* CASH PRICES IN BULK. *They will, however, be able to form a tolerably correct idea of what they ought to pay.*

	1861.				1860.			
	s.	d.	s.	d.	s.	d.	s.	d.
ARGOL, Cape..per cwt.	98	0..	103	0	95	0..	105	0
French	60	0..	85	0	30	0..	60	0
Oporto, white	0	0..	0	0	0	0..	0	0
red	50	0..	52	0	43	0..	45	0
Sicily	85	0..	92	6	70	0..	75	0
Naples, white	85	0..	90	0	0	0..	0	0
red	0	0..	0	0	0	0..	0	0
Florence, white	95	0..	105	0	90	0..	100	0
red	95	0..	97	6	85	0..	95	0
Bologna, white	125	0..	130	0	110	0..	0	0
ARROWROOT, duty 4½d. per cwt.								
Bermuda ....per lb.	1	1..	1	5	1	3..	1	7
St. Vincent	0	2¾..	0	6	0	2¾..	0	6¾
Jamaica	0	2½..	0	4¼	0	2 ..	0	5½
Other West India ..	0	2..	0	3¼	0	2..	0	3¼
Brazil	0	1½..	0	2¼	0	1½..	0	2¼
East India	0	1¾..	0	2½	0	1¾..	0	3
Natal	0	3 ..	0	7¼	0	3½..	0	4½
Sierra Leone	0	2½..	0	3½	0	2½..	0	3½
ASHES,......per cwt.								
Pot, Canada, 1st sort	31	0..	0	0	29	6..	0	0
U. S., 1st sort	0	0..	0	0	0	0..	0	0
Pearl, Canada, 1st sort	31	6..	0	0	30	0..	0	0
U. S., 1st sort	0	0..	0	0	0	0..	0	0
BRIMSTONE,								
rough ......per ton	£9	10..	9	15	£8	10..	8	15
roll	14	0..	0	0	11	10..	12	10
flour	16	10..	17	0	14	10..	0	0
CAPERS,								
French......per cwt.	£3	0..	£5	0	£3	10..	£6	15

	1861.				1860.			
CHEMICALS	s.	d.	s.	d.	s.	d.	s.	d.
Acid—Acetic, per lb.	0	3½..	0	4	0	4..	0	4½
Citric	2	1½..	2	2	2	2½..	2	3
Nitric	0	5..	0	5½	0	5..	0	5½
Oxalic	0	8½..	0	9	0	8½..	0	8¾
Sulphuric	0	0¾..	0	1	0	0¾..	0	1
Tartaric, crystal	2	0..	0	0	1	10..	2	0
powdered.	2	1 ..	2	2	1	10..	2	0
Alum ......per ton	£7	0	£0	0	£10	10	£0	0
powder	8	0..	0	0	8	10..	0	0
Ammonia, Carbon, lb.	0s.	6¼d.	0	6½d.	0s.	6½d.	0	6¾
	£	s.	£	s.	£	s.	£	s.
Sulphate ..per ton	14	0..	0	0	14	6..	15	6
Antimony, ore......	16	0..	17	0	16	0..	18	0
crude, per cwt..	32s.	0d.	42s.	0d	36s.	0d.	38s.	0d
regulus	50	0..	0	0	50	0..	52	0
French star	52	0..	0	0	50	0..	0	0
Arsenic, lump	17	0..	0	0	18	0..	0	0
powder	10	0..	0	0	11	0..	11	6
Bleaching Powder ..	10	0..	10	6	12	0..	12	6
Borax, E. I. refined..	0	0..	0	0	44	0..	64	0
British	65	0..	0	0	65	0..	70	0
Brimstone, roll......	14	0..	0	0	11	10..	12	10
flour	16	6..	17	0	14	0..	14	10
Calomel......per lb.	2	10..	0	0	2	10..	0	0
Camphor, refined ..	2	3..	0	0	1	8..	0	0
Copperas, green, pr tn.	65	0..	0	0	55	0..	65	0
Crrsiv. Sublimate, lb.	2	0..	0	0	2	1..	0	0
Green, Emerald, pr lb.	0	9..	1	0	0	9..	1	0
Brunswick, cwt..	14	0..	42	0	14	0..	42	0
Iodine, dry ..per oz.	0	5 ..	0	5¼	0	6¼..	0	6¾
Ivory Blk. drop pr. ct.	0	0..	0	0	0	0..	0	0

PRICE CURRENT—*continued.*

	1861.				1860.			
CHEMICALS.	s.	d.	s.	d.	s	d,	s.	d.
Magnesia, Carbon. ct.	42	6..	45	0	42	6..	45	0
Calcined, lb.....	1	6..	0	0	1	6..	0	0
Minium, red, per cwt.	23	6..	0	0	23	6..	24	0
orange	34	0..	0	0	36	0..	0	0
Potash, Bichrom., lb.	0	10½..	0	10¾	0	11 ..	0	11¼
Chlorate........	0	10½..	0	11	1	0..	0	0
Hydriodate ..oz.	0	5½..	0	6	0	7..	0	7¼
Prussiate ....lb.	1	2½..	1	3	1	4..	0	0
red..	2	2..	0	0	2	3..	0	0
Precipitate, red per lb.	2	10..	0	0	2	10..	2	11
white....	2	10..	0	0	2	10..	0	0
Prussian Blue	1	6..	1	10	1	6..	1	10
Rose Pink ..per cwt.	29	0..	30	0	29	0..	30	0
Sal-Acetos ....per lb.	0	10..	0	0	0	11 ..	0	0
Ammoniac, cwt.								
British ..	32	0..	33	0	32	6..	34	6
Epsom	8	3..	0	0	8	0..	0	0
Glauber	5	0..	5	6	5	0..	5	6
Saltpetre, refined....	41	6..	42	6	40	6..	42	0
Soda, Ash, per degree	0	2¼..	0	2½	0	2⅞..	0	3
Bicarbonate ...cwt.	13	6..	14	0	15	6..	16	0
Crystals....per ton	£5	0/	.£0	0/	£5	5/	.£5	7/6
Sugar Lead, white, ct.	39s.	0d.	0s.	0d.	38s.	0d.	39s.	0d.
brown..........	28	0..	0	0	28	0..	0	0
Sulphate Quinine, oz.								
British in bottle ..	8	2..	8	6	5	9..	0	0
Foreign	7	6..	7	9	4	0..	4	9
Sulphate Zinc ...cwt.	14	6..	15	0	14	0..	0	0
Verdigris ....lb.	1	3..	1	5	1	8..	2	0
Vermillion, English..	3	0..	3	4	3	0..	3	4
China....	2	11..	3	0	3	3..	3	9
Vitriol, blue or Roman								
per cwt...	34	0..	34	6	35	0..	35	6
CHICORY.... per cwt.								
Foreign (duty, 6s.) ..	13	0..	13	6	8	6..	9	0
COCHINEAL...per lb.								
Honduras, black....	3	0..	5	2	3	9..	5	6
silver	2	11..	3	7	3	3..	3	11
pasty	2	3..	2	10	2	10..	3	2
Mexican, black......	3	2..	3	8	3	6 .	4	0
silver......	2	9..	3	0	3	3..	3	5
Lima	3	0..	3	9	3	3..	4	0
Teneriffe, black	3	3..	4	0	3	8..	4	0
silver	2	11..	3	2	3	4..	3	7
COCOA (duty 1d. per lb.)								
Trinidad, red, in bond......per cwt.	68	6..	88	0	68	0..	88	0
gray	65	0..	68	0	64	0..	67	0
Grenada............	61	0..	67	0	58	0..	63	0
Dominica & St. Lucia	58	0..	62	0	55	0..	58	0
Para	62	0..	64	0	53	0..	56	0
Bahia..............	56	0..	58	6	43	0..	46	6
Guayaquil	67	0..	70	0	73	0..	75	0
COFFEE, in bond (duty 3d. per lb.)								
Jamaica, good, mid. to f...............	73	0..	92	0	72	0..	90	0
low mid. & mid.	67	6..	72	0	62	0..	70	0
fine ordinary ..	65	0..	66	0	59	0..	62	0
good ordinary ..	61	0..	64	0	57	0..	58	0
ord. and triage..	50	0..	61	0	42	0..	56	0
Ceylon, Nat. gd. & f.	61	0..	63	0	57	0..	63	0
ordinary	57	0..	60	0	51	0..	56	0
Plantation, fine..	85	0..	88	0	85	0..	90	0
fine mid.	77	0..	84	0	79	0..	84	0
good mid.	72	6..	76	0	75	0..	78	0
middling	67	0..	72	0	70	0..	74	0
fi. ord. to low md.	65	0..	66	6	66	0..	69	0
mixed and triage	51	0..	63	0	47	0..	65	6
Malabar and Mysore	58	0..	78	0	57	0..	78	0
Madras	58	0..	76	0	58	0..	76	0
Tellicherry	64	0..	90	0	62	0..	88	0
Mocha, fine	112	0	120	0	120	0	130	0
garbled	93	0	110	0	92	0	110	0
ungarbled	62	0..	86	0	62	0..	85	0
Batavia, yellow	63	0..	76	0	65	0..	77	0
pale and mixed..	58	0..	62	0	54	0..	64	0
Sumatra............	52	0..	56	0	48	0..	50	0
Padang	55	0..	61	0	50	0..	57	0
African	80	0..	85	0	0	0..	0	0
Brazil, f. ord. & wshd.	61	0..	71	0	59	0..	71	0
good ord.	57	0..	60	0	53	0..	58	0
ordinary	52	0..	56	6	47	0..	52	6

	1861.				1860.			
COFFEE.	s.	d.	s.	d.	s.	d.	s.	d.
La Guayra	60	0..	76	0	57	0..	78	0
Costa Rica, mid. to f.	67	0..	80	0	66	0..	78	0
good and f. ord.	60	0..	66	0	59	0..	65	0
Cuba, mid. to fine ..	67	0..	80	0	68	0..	78	0
f. ord. & f. f. ord.	63	0..	66	0	62	0..	66	0
ord. & good ord.	57	0..	62	0	55	0..	61	0
Porto Rico	60	0..	78	0	58	0..	78	0
St. Domingo........	58	0..	65	0	52	0..	59	0
DRUGS,	£.	s.	£.	s.	£.	s.	£.	s.
Aloes, Hepatic, pr. cwt.	3	10..	9	10	3	10..	9	0
Socotrine	6	0..	24	0	5	10..	25	0
Cape, good......	2	4..	2	8	1	15..	1	17
inferior ..	1	8..	2	2	1	2..	1	14
Barbadoes	2	0..	24	0	3	0..	20	15
Ambergris, gray, p. oz.	34s.	0d.	40s.	0d.	30s.	0d.	35s.	0d.
Angelica Root. pr. cwt.	35	0..	42	0	35	0..	42	0
Aniseed, China star..	70	0..	80	0	92	6..	95	0
German, &c.	32	6..	42	6	36	0	45	0
Balsam, Canada, pr. lb.	1	3..	0	0	0	9..	1	0
Capivi	2	2..	0	0	1	10..	1	11
Peru.........	4	9..	0	0	4	5..	4	6
Tolu	3	8..	3	9	3	9..	4	0
Bark, Cascarilla, cwt.	24	0..	49	0	30	0..	50	0
Peru. crwn. & gry. pr. lb.	1	7..	2	9	1	4..	2	9
Calisaya, flat ..	4	10..	5	0	2	8..	2	9
quill ..	4	6..	4	8	2	6..	2	9
Carthagena	1	2..	2	0	0	8..	1	0
Pitayo	1	6..	2	3	0	10..	1	10
Red	2	2..	6	0	2	0..	6	0
Bay Berrles, per cwt,	22	0..	40	0	24	0..	0	0
Borax..............	20	0..	37	6	28	0..	40	0
Tincal	32	0..	50	0	30	0..	50	0
Bucca Leaves ....lb.	0	4½..	1	6	0	5½..	1	6
Burgundy Pitch, p. cwt.	0	0..	0	0	0	0..	0	0
Camomile Flowers..	55	0	130	0	95	0	155	0
Camphor, China....	155	0	160	0	135	0	140	0
Canella Alba........	25	0..	46	0	25	0..	45	0
Cantharides ..per lb.	2	7..	2	9	3	0..	0	0
Cardmms. Mlbr. good	4	8..	4	10	4	6..	4	7
inferior ..	4	2..	4	6	3	10..	4	5
Madras ..	2	9..	4	4	3	3..	4	4
Ceylon ...	3	6..	3	9	2	3..	2	4
Cassia Fistula, pr. cwt.	28	0..	38	0	23	0..	30	0
Castor Oil, 1st pale, lb.	0	5¾	0	6¼	0	6½	0	7
second	0	5¼	0	5½	0	5½	0	6¼
infr. and dark	0	4¾	0	5	0	4¾	0	5¼
Bombay, in casks	0	4..	0	4½	0	3½	0	4¼
Castorum	1	0..	28	0	5	0..	20	0
China Root..per cwt.	9	0..	10	0	9	0..	10	0
Coculus Indicus	15	0..	16	0	10	0..	11	0
Cod-liver Oil, per gal.	4	9..	6	0	4	6..	7	0
Colocynth, apple, p. lb.	1	0..	1	4	0	10..	1	2
Colombo Root, per cwt.	15	0..	47	6	10	0..	30	0
Corosus Nuts, per cwt.	15	0..	27	0	22	0..	27	0
Cream Tartar, per cwt.								
French	137	6..	0	0	122	6	125	0
Venetian	140	0..	0	0	125	0	130	0
gray	122	6	125	0	110	6	112	6
brown..........	118	0	120	0	104	0	107	6
Croton Seed........	80	0..	90	0	75	0..	85	0
Cubebs	160	0	170	0	230	0	240	0
Cummin Seed	36	0..	40	0	22	0..	30	0
Dividivi............	12	0..	13	0	11	0..	12	0
Dragon's blood, reed.	£7	0	£14	0	£7	0	£15	0
lump	5	0..	13	0	5	0..	13	0
Galangal Root......	1	6..	1	8	1	13..	1	15
Gentian Root	0	14..	0	15	0	15..	0	0
Ginger, preserved, in bd.	s.	d.	s.	d.	s.	d.	s.	d.
(duty 2d. lb.) per lb.	0	8½..	0	9	0	10..	1	0
Guinea Gralns. per cwt.	48	0..	50	0	35	0..	37	0
Honey, Narbonne ..	70	0..	95	0	70	0..	90	0
Cuba	46	0..	55	0	22	0..	32	0
Jamaica	45	0..	73	0	26	0 .	54	0
Ipecacuanha, per lb..	4	7..	0	0	3	4..	3	7
Isinglass—								
Brazil............	1	10..	4	2	1	10 .	4	8
East India........	1	6..	3	10	1	10..	4	6
West India	3	6..	3	9	4	0..	4	5
Russian, long staple	12	0..	13	0	13	0..	14	0
leaf......	9	6..	12	0	11	6..	13	6
Simovia..	1	6..	2	6	1	6..	2	6
Jalap..............	4	7..	5	0	3	5..	3	6

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DRUGS.	s.	d.	s.	d.	s.	d.	s.	d.
Juniper Berries, p. cwt.								
German and French	9	0..	9	6	9	0..	10	0
Italian	9	0..	10	0	8	6..	10	6
Lemon Juice, per deg.	0	0⅞..	0	0	0	0⅞..	0	0
Lichen Islandicus, lb.	0	0..	0	0	0	0..	0	0
Liquorice... per cwt.								
Spanish	83	0..	90	0	85	0..	95	0
Italian	85	0..	95	0	95	0..	100	0
Macaroni, Genoa, p.lb.	0	3..	0	6	0	4..	0	6
Naples	0	4..	0	5½	0	4..	0	5½
Manna, flaky	3	9..	4	6	5	0..	0	0
small	2	0..	2	3	2	6..	0	0
Musk ....per oz.	26	0..	35	0	21	0..	27	0
Myrabolans, per cwt.	8	0..	11	0	7	6..	9	6
Nux Vomica........	11	0..	11	6	12	0..	13	0
Opium, Turkey	18	0..	18	6	19	0..	0	0
Egyptain....	6	0..	13	0	6	0..	15	0
Orris Root.. per cwt.	28	0..	31	0	34	0..	37	0
Pellitory Root	0	0..	0	0	0	0..	0	0
Pink Root....per lb.	1	2..	1	4	1	4..	0	0
Quassia (bit.wd.) ton	£4	0..	0	0	£10	0	£12	0
Rhatania Root . p lb.	0s.	9d.	0s.	0d	0s.	5d.	0s.	7d
Rhubarb, China, rnd.	1	0..	2	6	1	0..	2	9
flat..	1	2..	2	9	1	2..	3	0
Dutch, trimd.	3	3..	3	6	3	3..	3	6
Russian	11	6..	0	0	13	6..	14	0
Saffron, Spanish	54	0..	56	0	47	0..	50	0
Salep......per cwt.	£15	0s.	£0	0	£14	0	£15	10
Sarsaparilla, Lima..	0s.	10d..	1s.	2d	0s.	10d..	1s.	1d
Para	0	10..	1	2	0	11..	1	1
Honduras	0	11..	1	6	0	11..	1	5
Jamaica .	1	3..	2	6	1	3..	2	6
Sassafras....per cwt.	10	0..	12	0	9	0..	10	0
Scammony .. per lb.								
virgin	28	0..	34	0	30	0..	33	0
second	14	0..	24	0	14	0..	26	0
Seedlac	55	0..	70	0	35	0..	50	0
Seneka Root........	2	2..	0	0	2	3..	0	0
Senna, Calcutta	0	2..	0	2½	0	2..	0	2½
Bombay	0	2½..	0	4	0	2..	0	3½
Tinnevelly	0	3..	0	8	0	4..	0	6¾
Alexandria	0	5..	0	7	0	4..	0	6
Shellac, orange, pr.ct.	225	0	245	0	160	0..	170	0
liver & garnet.	205	0	215	0	155	0..	173	0
block	205	0	210	0	150	0..	162	6
bttn.dk.to mid.	205	0	210	0	145	0..	150	0
good and fine.	215	0	225	0	155	0..	165	0
Snake Root	1	2..	1	3	0	10..	0	0
Spermaceti, refined..	1	6..	0	0	1	10..	0	0
Squills	0	1..	0	2	0	1¼..	0	3
Sticklac	65	0..	97	6	40	0..	63	0
Tamarinds, E. India.	8	0..	12	0	9	6..	11	6
W.I. per cwt.	16	0..	35	0	15	0..	33	0
Terra Japónica,								
Gambier.. per cwt.	17	3..	17	6	16	0..	16	3
Cutch	25	0..	25	6	28	0..	0	0
Valerian Root, Engl.	20	0 .	40	0	20	0..	40	0
Vanilla,								
Mexican .. per lb.	30	0..	70	0	40	0..	80	0
Brazil............	0	0..	0	0	14	0..	20	0
Wormseed ..per cwt.	1	0..	0	0	23	0..	0	0
FARINA, Scotch	20	0..	25	0	16	0..	16	6
GUM ....per cwt.	£.	s.	£.	s.	£.	s.	£.	s.
Ammoniac, drop	2	15..	5	0	2	15..	5	0
lump....	0	15..	2	0	1	0..	2	0
Animi, fine pale	15	10..	16	0	14	10..	15	10
bold amber ..	13	0..	14	5	12	0..	14	0
medium	9	0..	11	11	7	10..	10	10
small & dark.	5	0..	8	5	4	0..	6	10
ordinary dark	2	10..	5	0	2	10..	5	0
Arabic, E.I.f. palepickd	2	13..	3	3	2	15..	3	0
unsorted, good to f.	1	18..	2	10	1	15..	2	6
red and mixed	1	8..	1	16	1	2..	1	10
siftings	0	0..	0	0	0	18..	1	3
Turkey, pkd. gd. to fi.	5	10..	7	10	5	10..	7	5
second & infr.	2	2..	5	5	2	5..	5	0
in sorts	1	10..	2	3	1	9..	1	13
Gedda	1	6..	1	7	1	4..	1	5
Barbary, white......	1	11..	1	12	1	10..	1	11
brown	1	9..	1	10	1	10..	1	11
Cape	0	16..	0	18	0	16..	0	18
Assafœtida, fair to gd.	1	0..	5	0	1	5..	4	10
Benjamin, first qual.	18	10..	34	0	18	0..	34	0
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GUM.	£.	s.	£.	s.	£.	s.	£.	s.
Benjamin, 2nd qual.	8	5..	16	10	8	10..	16	10
3rd ,,	3	0..	7	10	3	5..	7	10
Copal, Angola red ..	5	0..	5	15	3	11..	3	18
pale..	4	5..	5	0	3	6..	3	10
Benguela	4	10..	6	0	3	10..	3	15
Sierra Leone lb.	0s.	10d.	1s.	9d	1s.	0d.	1s.	9d
Manilla, pr. ct.	15	0..	43	0	0	0..	0	0
Dammar, pale, pr. ct.	48	0..	52	0	46	0..	50	0
	£.	s.	£.	s.	£.	s.	£.	s.
Galbanum..........	7	0..	9	0	8	0..	10	0
Gamboge, pkd. pipe .	6	0..	7	10	5	10..	7	10
in sorts ..	4	0..	5	10	4	0..	5	0
	s.	d.	s.	d.	s.	d.	s.	d.
Guaiacum ....per lb.	0	9..	1	9	0	10..	1	9
Kino ...... per cwt.	95	0 .	120	0	60	0..	70	0
Kowrie	22	0..	24	0	13	0..	15	0
Mastic, pkd., per lb..	8	0..	9	0	9	6..	10	0
Myrrh, gd. & fi., pr. ct.	140	0	180	0	160	0	230	0
sorts	80	0	130	0	90	0	150	0
Olibanum, pale drop.	60	0..	66	0	42	0..	48	6
amber & yellow	40	0 .	54	0	29	0..	40	0
mixed & dark..	12	0..	26	0	10	0..	24	0
Senegal	34	0..	38	0	28	0..	33	0
Sandrac............	90	0	110	0	94	0	120	0
Tragacanth, leaf	180	0	340	0	190	0	290	0
in sorts .	100	0	130	0	100	0	126	0
LAC DYE, per lb. D. T.	1	10½..	1	11	1	10½..	0	0
B Mirzapore........	1	7..	1	8	1	7..	0	0
Other good and fine..	1	0..	2	3	1	0..	2	3
Ord. & Native marks	0	2..	0	11	0	2 ..	0	10
OILS..........per tun	£.	s.	£.	s.	£.	s.	£.	s.
Seal, pale	39	10..	40	0	33	0..	0	0
yellow	34	0..	35	0	30	0..	31	0
brown	33	0 .	34	0	28	0..	0	0
Sperm, body........	100	0	102	0	93	0..	94	0
headmatter	103	0	104	0	96	0..	97	0
Cod................	37	0..	38	0	31	0..	0	0
Whale, Greenland ..	0	0..	0	0	37	0..	37	5
South Sea, pale	37	0..	0	0	32	0..	0	0
yellow	34	0..	0	0	30	0..	0	0
brown	33	0..	0	0	28	10..	0	0
E. I. Fish	30	0..	0	0	26	10..	27	0
Olive, Galipoli ..tun	62	0..	0	0	57	0..	0	0
Trieste	58	0..	59	0	51	0..	53	0
Levant	57	0..	57	10	50	0..	51	0
Mogadore	56	0..	56	10	50	0..	0	0
Spanish	60	0..	0	0	56	0..	0	0
Sicily	58	0..	0	0	54	0..	0	0
Florence, pr. ½-chst.	0	16..	0	0	0	18..	1	0
Cocoanut, Cochin, tun	55	0..	0	0	43	10..	0	0
Ceylon....	53	0..	0	0	41	10..	0	0
Sydney ..	48	0..	51	0	35	0..	41	0
Ground Nut and Gin.								
Bombay..........	40	0..	40	10	34	0..	35	0
Madras	42	0..	43	0	40	0..	41	0
Palm, fine	47	0..	0	0	45	10..	46	0
Palm Nut..........	41	0..	42	0	35	10..	36	10
Linseed	28	5..	0	0	27	10..	0	0
Rapeseed, Engl. pale.	43	10..	0	0	36	0..	37	10
brown	41	0..	0	0	35	0..	0	0
Foreign do.	44	0..	45	0	38	10..	0	0
brown	41	10..	42	0	36	0..	0	0
Lard	63	0..	0	0	60	0..	0	0
Tallow	32	10..	0	0	30	0..	0	0
Rosin	7	5..	0	0	6	15..	0	0
OILS, Essential;	s.	d.	s.	d.	s.	d.	s.	d.
Almond, essen. pr. lb.	30	0..	31	0	30	0..	31	0
expressed..	1	0..	0	0	1	0..	0	0
Aniseed	7	5..	7	6	8	2..	8	3
Bay........ per cwt.	122	6..	0	0	90	0	100	0
Bergamott....per lb.	6	6..	14	0	6	6..	11	0
Cajeputa, bond, pr. oz.	0	1½..	0	1¾	0	1..	0	0
Caraway .... per lb.	4	3..	6	0	4	6..	6	0
Cassia............	10	9..	0	0	14	9..	15	0
Cinnamon (inb.) p.oz.	3	0..	4	3	2	9..	3	10
Cinnamon Leaf	0	1..	0	2½	0	2½..	0	3
Citronel............	0	5..	0	5¼	0	3..	0	3¼
Clove............	0	4¼..	0	0	0	2½..	0	3¾
Croton	0	3 ..	0	4	0	4¼..	0	4½
Juniper .....per lb.	1	10..	4	0	3	0..	5	0
Lavender	2	6..	5	0	2	6..	5	0
Lemon	5	0..	10	0	5	0..	11	0
Lemongrass..per oz.	0	6½..	0	7	0	5..	0	5¾

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	1861.				1860.			
OILS, Essential,	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
Mace, ex	0	2 ..	0	0	0	1¾..	0	2
Neroli	6	0..	9	0	6	0..	10	0
Nutmeg	0	1¾..	0	2	0	2¼..	0	2½
Orange ......per lb.	7	0..	8	0	10	0..	11	0
Otto Roses ..per oz.	16	0..	26	0	16	0..	24	0
Peppermint ..per lb.								
American	7	6..	15	3	8	0..	13	9
English	35	0..	43	0	30	0..	34	0
Rhodium ....per oz.	3	9..	6	0	3	9..	6	0
Rosemary ....per lb.	1	10..	3	0	2	0..	3	0
Sassafras	3	0..	3	6	3	6..	4	0
Spearmint	5	0..	12	6	8	0..	14	0
Spike	1	3..	1	6	1	3..	1	6
Thyme	1	9..	2	6	2	3..	3	0
PITCH, British, pr. cwt.	6	0..	6	3	6	0..	6	3
Swedish	10	3..	0	0	10	3..	0	0
SALTPETRE, per cwt.								
Bengal, 6 p.c. or under	40	0..	41	0	40	0..	41	6
over 6 per cent.	36	0..	39	6	35	6..	39	6
Madras	35	6..	39	0	33	0..	37	0
Bombay	35	0 ..	38	0	28	6..	33	0
British-refined	41	6..	42	6	40	0..	42	0
Nitrate of Soda	13	0 .	14	0	15	6..	16	0
SEED, Canary ...p. qr.	44	0..	60	0	46	0..	54	0
Caraway, English, p.c.	28	0..	30	0	0	0..	0	0
German, &c.	26	0 .	34	0	30	0..	38	0
Clover, English, red..	0	0..	0	0	0	0..	0	0
white..	0	0..	0	0	0	0..	0	0
Germ. & French, red	0	0..	0	0	0	0..	0	0
white..	0	0..	0	0	0	0..	0	0
Coriander	0	0..	0	0	0	0..	0	0
East India	11	0..	12	0	11	6..	12	6
Hemp	44	0..	46	0	32	0..	34	0
Linseed, English, p. qr.	70	0..	75	0	0	0..	0	0
Black Sea and Azof	57	0..	58	0	48	0..	49	0
Calcutta	59	0..	60	0	48	6..	0	0
Bombay	62	0..	0	0	52	0..	0	0
Egyptian	55	0..	56	0	48	0..	0	0
St. Ptrsbg.. Morshnk	57	0..	58	0	47	0..	0	0
Archangel	49	0..	50	0	38	0..	0	0
Riga	44	0..	45	0	0	0..	0	0
Mustard, brown, p. bhl	9	0..	12	0	10	0..	13	0
white	8	0..	12	0	11	0..	14	0
Niger	50	0..	0	0	35	0..	36	0
Poppy, E.I. ..per qr.	59	0..	60	0	46	0..	0	0
Rape, English	0	0..	0	0	0	0..	0	0
Danube	63	0..	0	0	50	0..	0	0
Calcutta, fine	60	0..	0	0	46	0..	0	0
Bombay, Guzerat	68	0..	69	0	50	0..	55	0
Feroze. & Scinde	61	0..	0	0	36	0..	46	0
Teel, Sesame or Gngly.	56	0..	65	0	44	0..	52	0
Cotton ......per ton	8	0..	8	10	5	0..	5	5
Gnd. Nut Kernels, tn.	330	0..	0	0	230	0..	245	0
SOAP, Lond. yel. p. cwt.	21	0..	38	0	21	0..	38	0
mottled	34	0..	38	0	36	0..	38	6
curd	52	0..	0	0	52	0..	0	0
Castile	37	0..	40	0	37	0..	40	0
Marseilles	40	0..	41	0	40	0..	41	0
SOY, China ..(per gal.)	3	3..	3	6	4	0..	4	3
Japan	1	6..	1	9	0	0..	0	0
SPICES, duty free, except pepper,								
Cassia Lignea, p. cwt.	85	0..	94	0	98	0	105	0
Vera	12	0..	53	0	10	0..	24	0
Buds	190	0..	0	0	180	0	185	0
Cinnamon, per lb.								
Ceylon, 1st quality.	1	5 .	2	3	1	7..	2	3
2nd ditto ..	1	2..	1	8	1	1..	1	9
3rd ditto ..	0	9..	1	3	0	10..	1	4
Tellicherry	0	10..	1	0	0	9..	0	11
Cloves, Penang	1	1½..	1	5½	1	2½..	1	4½
Amboyna	0	4½.	0	5	0	5..	0	5¾
Zanzibar	0	4 .	0	4⅛	0	3..	0	3⅗
Ginger	£	s.	£	s.	£	s.	£	s.
Jamaica, fine pr. cwt.	7	0..	9	10	8	0..	10	0
ord. to good	3	5..	6	6	4	0..	7	10
African	36s.	6d..	37s.	6d.	36s.	0d.	37s.	6d.
Bengal	30	0..	32	0	21	6..	22	0
Malabar	0	0..	0	0	0	0..	0	0
Cochin	40	0.	105	0	77	0.	130	0
Mace, 1st qlty. lb.	1	7..	2	2	1	9..	2	6
2nd. & infr.	0	9..	1	6	1	1..	1	8
Nutmegs per lb.								
brown Penang, &c.	1	1..	4	0	1	6..	3	6
limed	1	1..	2	5	1	3..	2	7

	1861.				1860.			
SPICES,	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
Pepper (duty 6d. pr. lb.)								
Black, in bond								
Malabar	0	4⅞..	0	5⅛	0	4⅝	0	5⅝
Aleppee	0	4¾..	0	4½	0	4½	0	4¾
Penang & Batavia	0	3⅝..	0	3⅞	0	3⅞..	0	4⅛
Singapore	0	3⅞..	0	4	0	4⅛	0	4¼
White, Tellicherry.	0	10½..	1	5	0	9¾.	1	0
Other sorts	0	5¾ .	0	6⅝	0	6½..	0	7½
Cayenne	1	1 ..	1	8	1	0..	1	3
Pod, S. Leone pr. c.	28	0..	32	0	20	0..	30	0
Zanzibar	78	0..	81	0	55	0..	60	0
Long	32	0..	34	0	35	0..	40	0
Pimento, mid. to good	0	2¾..	0	3	0	4 ..	0	4⅛
ordinary	0	2½..	0	2⅝	0	3⅞ .	0	0
SPONGE, Turk. f. pkd.	20	0..	26	0	20	0..	26	0
fair to good	9	0..	18	0	9	0..	18	0
ordinary ..	3	0..	8	0	3	0..	8	0
Bahama ..	0	3..	1	0	0	3..	1	0
TEA (duty 1s. 5d. per lb.) in bond.								
Congou, ordinary	0	10..	1	0	1	1 ..	1	2
good ordinary	1	0½..	1	1½	1	3..	1	3½
but middling.	1	2½..	1	4	1	3½..	1	4½
blackish leaf	1	4½..	1	6	1	5..	1	6
ditto strong	1	7..	1	8	1	7 ..	1	11
ditto to extra fine..	1	9..	2	5	2	0..	2	6
Ning Yong and Oolong	1	3..	2	0	1	7..	2	4
Souchong, ordinary..	1	1..	1	4	1	3..	1	5
fair to fine	1	5..	1	10	1	6..	2	2
finest	2	0..	3	1	2	3..	3	3
Flowry Pekoe, ordinary	0	0..	0	0	0	0..	0	0
fair to good	1	5½..	2	2	2	0..	2	6
fine to finest	3	0..	5	0	3	0..	4	6
Caper, scented, in bxs.	0	9¾..	2	1	1	0..	2	6
Orange Pekoe, plain..	0	11..	1	4	1	0..	1	6
scented	1	2..	2	3	1	3..	2	6
Twankay, ordy. Canton	0	0..	0	0	0	0..	0	0
common to good..	0	9..	1	2	0	9..	1	2
fine to Hyson kind.	1	3..	1	4	1	3..	1	4
Hyson Skin, common	0	8..	0	10	0	9..	0	10
good to fine	0	11..	1	1	0	11..	1	1
Hyson, ordy. to comn.	1	4..	1	7	1	6..	1	7
fair to fine	1	8..	2	6	1	8..	2	6
finest	2	9..	4	6	2	9..	4	0
Young Hys. Boh. kind	0	9..	0	10	0	7..	0	9
good to fine	1	0..	2	3	0	11..	2	4
Imperial	1	0..	2	2	1	0..	2	2
Gunpowder	0	11..	3	9	0	11..	3	9
Assam	1	7..	4	6	1	9..	5	0
TURPENTINE,								
Rough.... per cwt.	10	0..	0	0	9	9..	10	0
Spirits, English	30	6..	0	0	33	0..	0	0
American, in casks	31	6..	0	0	34	6..	0	0
WAX, Bees, English ..	£8	5..	£8	10	£8	5..	£8	10
German	8	0..	8	5	8	0..	8	10
American	9	0..	10	0	8	15..	9	0
white fine	10	0..	10	19	10	0..	10	10
Jamaica	9	10..	10	5	9	0..	9	9
Gambia	9	0..	0	0	8	10..	8	15
Mogadore	6	10..	8	5	6	0..	7	5
East India	7	10..	9	0	7	10..	9	0
ditto, bleached	10	10..	12	0	9	0..	10	0
vegetable, Japan	2	18..	3	5	3	5..	3	7
WOOD, DYE, bar, pr. tn.	0	0..	0	0	4	0..	0	0
Brazil, first quality	70	0..	75	0	80	0..	0	0
second quality..	55	0..	60	0	60	0..	0	0
logs	20	0..	21	0	20	0..	35	0
Braziletto	4	0..	5	10	3	10..	5	10
Camwood	20	0..	24	0	28	0..	34	0
Ebony, Green	8	0..	9	0	12	0..	0	0
Fustic, Cuba	8	10..	9	0	8	15..	9	0
Jamaica	5	10..	5	15	5	15..	0	0
Savanilla	5	0..	5	5	5	5..	5	10
Zante	5	10..	8	0	9	0..	11	0
Logwood, Campeachy	6	10..	6	15	6	15..	7	0
Honduras ..	0	0..	0	0	5	5..	5	10
St. Domingo	5	0..	5	5	5	5..	0	0
Jamaica	4	15..	0	0	4	17..	5	0
Nicaragua, lar. & sol.	10	10..	11	0	12	0..	13	10
small	0	0..	0	0	6	0..	8	0
Lima, first pile	12	0..	12	10	13	0..	14	0
second pile ..	10	0..	10	10	12	10..	13	0
Red Sanders	5	10..	5	15	4	12½..	0	0
Sapan, Bimas	6	0..	8	10	8	0..	9	10
Siam, &c.	6	0..	9	5	7	0..	9	5

PATENTS

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LETTERS PATENT.

DRUGS, CHEMICALS, ETC.

1287 Clapham, R. C., Walker, Northumberland; Cail, R., Gateshead, improved deodorising agents.

1305 Brooman, R. A., Fleet-street, treating certain animal substances to obtain albuminous, gummy, glutinous, and glairy products, and fat.

1309 Robinson, G., Newcastle-upon-Tyne, improvements in the manufacture of salts and preparations of ammonia.

1480 Keates, T. W., Blackfriars, an improved mode of separating carbonic acid gas from the gaseous products derived from the distillation of peats and other vegetable matter.

INDIA RUBBER.

1546 Hooper, W., Mitcham, improvements in reworking compounds of india rubber and sulphuric acid, and in insulating telegraphic wires or conductors.

MISCELLANEOUS.

1286 Johnson, T., Plumstead, improvements in machines for washing bottles and jars.

1343 Manning, J. A., Inner Temple, improvements in the treatment, application, and use of sewerage matters, and the general wastes of towns and factories.

1404 Clark, W., Chancery-lane, improvements in the preservation of animal and vegetable matters.

1408 Waller, G. A., Dublin, improvements in apparatus for filtering and solidifying.

1463 Brooman, R. A., improvements in desiccating substances, and in neutralising or retaining any fœted gases which may be evolved in the process.

1507 Baker, W., Sheffield, improvements in the process of softening and purifying lead.

1549 Cartwright, M., Carlisle, improvements in the manufacture of mouth-pieces for dental and other purposes.

1554 Fletcher, J., Southwark, improvements in the apparatus for treating saccharine and saline solutions.

1559 Latta, M. J. L., Ashton, Gourock, improvements in the treatment of various substances for the purpose of rendering the same non-inflammable.

1567 Bosselaers, C., Mark-lane, an improved apparatus for corking bottles, jars, and other vessels.

1586 Laming, R., Maida-hill; West and Smith, C., Regent's-park, improvements in purifying certain gases and liquids from sulphuretted hydrogen.

1740 Oxland, R., Plymouth, improvements in the manufacture of gunpowder.

1804 Ash, H. C., Clapham-road, improvements in apparatus employed in cooling and freezing liquids.

2046 Kershaw, G., Slough, improvements in the construction of medico-electric surfaces.

2461 Barnett, T., Beverley, improvements in machinery for drying grain, roots, and seeds, and for roasting coffee, cocoa, chicory, malt, and other vegetable substances.

PROVISIONAL PATENTS.

DRUGS, CHEMICALS, ETC.

2654 Newton, W. E., improvements in the production of alumina and salts of alumina.

2683 Taylor, J. J. O., an improvement in the separation of silex and silicious and other matters from steel.

2711 Webster, J., Birmingham, improvements in obtaining gas (mainly oxygen) for improving artificial light, and for other purposes; also for utilising the products resulting from its manufacture.

2777 Henrionnett, M. Le, and Boblique, L. O., Paris, improvements in the treatment of fossil and other mineral phosphates of lime.

2764 Forster, W. C., Lambeth, an improved method of manufacturing soluble silicate of potash.

2804 Ralston, W. H., Keele, improvements in the manufacture of soda ash.

2861 Ralston, W. H., Keele, improvements in the manufacture of hydrate of soda.

2949 Losh, W. S., Wreay Syke, a new method of preparing sulphurous acid in solution.

3033 Townsend, J., Glasgow, improvements in obtaining animal charcoal and other products from bones and other animal matters.

INDIA RUBBER AND GUTTA PERCHA.

2689 Newton, W. E., Chancery-lane, an improvement in preparing compounds of india rubber, gutta percha, and allied gums.

MISCELLANEOUS.

2614 Tiernan, R., Liverpool, improvements applicable to infants' and invalids' feeding bottles, and other purposes.

2699 Wrigley, T., Bury, improvements in apparatus for filtering water and other liquids.

2712 Seed, B., Bradford, improvements in apparatus used in the treatment of soap suds or other saponaceous or oily matters, which apparatus is also applicable in the treatment of other matters.

2730 Wilson, G., York, an improved construction of stoppered bottle.

SUPPLEMENT.

REVIEW OF 1860.

NOTICES

OF SOME OF THE CONTRIBUTIONS MADE TO CHEMISTRY DURING THE YEAR.

THE most interesting and, in a philosophical view, perhaps the most important discovery in chemistry which has been made during the past year, is that of Professors Bunsen and Kerchhoff, of a mode of chemical analysis by spectrum observations. The memoir of these distinguished physicists is too valuable to be disposed of in a mere brief notice, and we purpose presenting our readers with a pretty full report of it in our next number.

DECOMPOSITION OF GAZEOUS COMPOUNDS BY ELECTRAL INCANDESCENCE.—Professors Buff and Hoffman have communicated some experiments on compound gases, made with the spark current of the induction coil, and with coils of iron and platinum rendered electrically incandescent, with the view of ascertaining whether a simple experimental illustration of relations, with difficulty attainable by other methods, could not be exhibited. The following are some of their most instructive results:—*Ammonia* was decomposed rapidly by the spark current, the volume of the gas being doubled. *Cyanogen* was completely decomposed in half-an-hour by incandescent iron, the volume of the gas being unaltered. *Nitrous oxide* was decomposed in a few minutes by incandescent iron, leaving an equal volume of nitrogen. *Nitric oxide* was decomposed in the same way in three or four minutes, the iron burning with splendid scintillations, and a volume of nitrogen equal to half the original volume being left. *Carbonic acid* was decomposed, though very slowly, by the spark current into carbonic oxide and oxygen. *Marsh gas* and *olefiant gas* were only partially decomposed. *Sulphurous acid gas* was decomposed by the incandescent coil with the greatest facility. These results appear to render it probable that the applications of electricity in gazeous analysis will receive some very important developments.

ANALYSIS OF AIR FROM MONT BLANC.—Dr. Frankland has analyzed air from Mont Blanc, at an altitude of 11,000 feet; the mean per centages of nitrogen, and oxygen, and carbonic acid, were—

Nitrogen	79·056
Oxygen	20·881
Carbonic acid	·063
	100·000

Dr. Miller had previously examined air collected during a balloon ascent at a height of 18,000 feet, and found 20·88 per cent. of oxygen; whilst a sample of air collected at the same time near the surface of the earth, furnished 20·92 per cent. of oxygen; it would seem, therefore, that in the higher regions of the atmosphere there is a slight diminution in the amount of *oxygen*, and a slight increase in the proportion of carbonic acid.

SPONTANEOUS DECOMPOSITION OF GUN COTTON.—Some gun cotton which had been kept by Dr. Percy for some years in a well-stoppered glass bottle, was found to be decomposed into *oxalic acid and gum.*

BISULPHIDE OF CARBON IN COAL GAS.—Dr. Hofmann has undertaken some experiments to ascertain the amount of bisulphide of carbon in London coal gas. He finds it to be very small, though somewhat greater in winter than in summer.

GUTTA PERCHA.—It is well known that gutta percha undergoes a change by exposure to the air, becoming brittle, and for certain purposes (as for coating telegraph wires) useless. Hofmann has shown that this change depends upon *oxidation;* for he found that, while good gutta percha is entirely free from oxygen, the *changed* variety yielded to alcohol, a substance containing 26 to 28 per cent. of that principle.

ORGANO-METALLIC BODIES.—In a discourse delivered to the members of the Chemical Society, and recently published in the journal of that body, Dr. Frankland has given a luminous history of that remarkable class of compounds known as the organo-metallic bodies, to which the reader who is desirous of learning what has been done in this interesting field of discovery during the last ten years may profitably turn for information. M. Cahours also continues his researches, and has published a long memoir in the *Annales de Chimie et de Physique.*

WHOLESALE MANUFACTURE OF OXYGEN.—Messieurs H. St. Claire Deville and H. Debray have shown that sulphate of zinc—a substance not much in use at the present time, and which can be obtained in such large quantities by the action of the galvanic pile—may be transformed at a temperature not much higher than that required for the decomposition of oxide of manganese, into *oxide of zinc* and a mixture of *water*, *sulphurous acid*, and *oxygen.* They have also shown that sulphuric acid, at a red heat, decomposes into the same products; the gases are first passed through a refrigerator, which separates the water, and then into a washer, or through a lixivium of soda, which removes the sulphurous acid, and the remaining pure inodorous oxygen then passes into a suitable reservoir. If the sulphurous acid is condensed by water, the aqueous solution may be passed into the generator which feeds the leaden chambers in a sulphuric acid factory; the sulphurous acid will then be re-converted into sulphuric acid at the expense of the oxygen of the air. The net cost of this manufacture of pure oxygen is so slight that the authors find it impossible to give even an approximation to it; but they say that, even if the whole of the sulphurous acid be lost, it would still be a cheaper source of oxygen than even binoxide of manganese; and they consider that manufacturing industry, either as regards lighting or the working of metals, will derive great benefit from their experience. The oxide of zinc obtained may (if the sulphate be pure) be used in painting.

PHOSPHORUS IN THE AIR.—M. Burral has communicated to the Academy of Sciences, at Paris, an important discovery he has made, viz., that rain-water contains a notable quantity of phosphoric acid, probably in the form of phosphate of lime carried by the wind as dust, or a phosphorated hydrogen from the putrefaction of animal matters. He computes that 440 gallons of rain-water contain from 13 to 15 grains of phosphorus, and that the atmosphere delivers annually to the soil 2,400 grains per acre.

CHEMICAL CONSTITUTION OF CAST IRON AND STEEL.—Fremy confirms the observations of Caron relative to the influence exerted by nitrogen over the phenomena of *steeling;* he finds that the *humus* looking substance which is left after treating cast iron with bichloride of copper, disengages, when heated, a considerable quantity of ammonia, and shows an analogy with certain derivatives of cyanogen. He regards cast iron and steel as combinations of metal with a compound radical comparable to cyanogen, and which, like it, is produced directly by combination of carbon with atmospheric nitrogen.

PRODUCTION OF A VALUABLE MANURE FROM THE AIR.—The highly important agricultural problem of the fixation of the nitrogen of the air in the form of ammonia has been solved by M.M. Marguerite and De Tourdeval. Their process is founded on the *cyanuration of barium*, and the subsequent decomposition of the cyanide by steam. A mixture of carbonate of baryta, iron filings, refuse of coal tar, and sawdust, is first calcined through an earthen retort; through the porous mass thus obtained, a current of air is passed, the oxygen of which is converted into carbonic oxide, while its nitrogen is transformed in the presence of charcoal and barium into cyanogen, and produces considerable quantities of cyanide of barium. The calcined mixture is introduced into a strong iron cylinder, and a current of steam at a temperature less than 300° is passed through it. All the nitrogen in the cyanide is disengaged under the form of *ammonia.* It is impossible, observe the authors, to foresee all the results of this discovery. Among other things, it suggests the production of nitric acid from the air by oxidizing ammonia.

A NEW METAL.—Von Kobell announces the discovery of a new metallic acid in various minerals—tantalite, euxenite, pyrochlore, &c., to which he has given the name of *dianic* acid —the metal being called *dianium.* It belongs to the same group as *tantalic* and *niobic* acids; Terreil has also rendered it probable that *vanadium* is not so rare a metal as is generally supposed, as he has confirmed its presence in many clays.

NEW ALKALOIDS GIVEN OFF DURING PUTREFACTION.—Grace Calvert has communicated to the Royal Society the commencement of some researches, the prosecution of which will, he says, occupy him several years, on some new volatile alkaloids which are evolved during the putrefaction of meat and fish; these alkaloids are remarkable, as containing besides nitrogen, large quantities of sulphur and phosphorus; he thinks it probable that this investigation may throw some light upon the contagion known as "hospital gangrene."

Alcoholic Fermentation.—M. Pasteur, who has made this his special study for some years, announces that the generally received opinion that *cane* sugar, $C_{12}\ H_{11}\ O_{11}$, after being modified into *grape* sugar, $C_{12}\ H_{12}\ O_{12}$, when mixed with yeast, ferments, and splits up into alcohol and carbonic acid, the sum of the weights of which represent very nearly the weight of the sugar, is only a rough approximation to the truth; and that amongst the products of the fermentation are *glycerine, succinic acid, cellulose*, and some other undetermined matters—100 grammes of sugar-candy, fermented with 1·198 grammes of dry yeast, gave after fermentation:—

Glycerine	3·640
Succinic acid	0 673
Cellulose, &c.	1·633
	5·946

The elements of these bodies being furnished solely by the sugar. M. Pasteur is still engaged in the study of the transformations which sugar undergoes inconsistent with the theoretical equation $C_{12}\ H_{12}\ O_{12} = 4\ CO_2 + 2\ (C_4\ H_6\ O_2)$.

Substitutes for Quinine.—The Society of Pharmacy of Paris have offered a prize of 6,000 francs, to which the Minister of War will add 4,000 francs, for the discovery of a substitute possessing equivalent febrifuge properties to *quinine*, or for the artificial formation of that alkali. Nine essays have been sent in, neither of which has been thought deserving of the prize, which is left open until 1st of July, 1861.

Ozone.—Messrs. Andrews and Tait have communicated to the Royal Society the results of their experiments on the volumetric changes which occur in the formation of *ozone.* They find that when ozone is formed from pure oxygen, by the action of the electrical discharge, there is a considerable condensation; so that, if the allotropic view of the constitution of ozone be correct, the density of that body, as compared with oxygen, would be represented by a number corresponding to the density of a *solid* or *liquid*, rather than that of a *gaseous* substance.

Nitrification.—Millon has observed that *nitre* is always produced with regularity provided a humus product, an ammoniacal salt, and a mixture of earthy carbonates, are present, the solid mass being constantly moistened and exposed to the air. The action of the alkaline humate is to absorb oxygen, and this oxidation is transferred to the ammonia, which hereby becomes converted into nitric acid.

Cementation.—Caron surrounded an iron bar by pieces of charcoal, and packed it in a porcelain tube, which was heated to redness in a reverberating furnace, while pure *hydrogen, carbonic oxide, nitrogen, air,* and *carburetted hydrogen* gases were passed through the tube in successive operations, each lasting two hours; no true cementation took place; but when *ammonia* was passed through, the bar, after tempering and hammering, exhibited a regular and beautiful cementation of $\frac{1}{10}$ inch in depth: this was attributed to the action of ammonia on carbon, forming *cyanide* of ammonium, which giving up carbon to the iron forms steel, an explanation which seems confirmed by the fact that on heating an iron bar *without charcoal* to redness in a current of gaseous cyanide of ammonium, it became cemented. It would seem, therefore, that the real cementation elements are alkaline cyanides, to the formation of which the action of the various receipts may be referred.

Spectrum Analysis of London Waters.—Thames water taken at low and high tide, Westminster Bridge, samples from the Chelsea and Lambeth Water Companies, from the New River, from the wells above the London clay, from the sand above the chalk, and from the chalk, have been submitted by A. and F. Dupré to spectrum analysis, by the beautiful method of Bunsen and Kirchhoff, and in all cases *lithium* and *strontium* were detected.

Tungstic Acid.—This acid exists, according to Scheibler, in two distinct modifications, one insoluble in water, and the other soluble, and there are two corresponding groups of salts. The soluble variety, *metatungstic acid*, is an admirable re-agent for nitrogenous bases, which are all precipitated by it in white flakes. Acid solutions which only contain $\frac{1}{200000}$ of *quinine*, are, according to Scheibler, made distinctly turbid, and deposit flakes after twenty-four hours. Any of the salts of metatungstic acid mixed with a mineral acid act equally well.

CALCIUM.—Caron obtains this metal in quantity by heating to redness in a crucible 300 parts of fused and powdered chloride of calcium, 400 parts of granulated zinc, and 100 parts of sodium. The regulus thus obtained contains from 10 to 15 per cent. of calcium, which is obtained (with traces of iron) by heating the alloy in a carbon crucible. It is of a pale yellow colour, density 1·6 to 1·8, not volatile, keeps tolerably well in dry air, burns with difficulty in the blowpipe flame, giving rise to red scintillations of great beauty.

NEW FUSIBLE ALLOY.—Dr. Wood has patented an alloy composed of *cadmium*, one to two parts; *bismuth*, seven to eight parts; *tin*, two parts; *lead*, four parts, which fuses at more than 40° F. lower than *Rose's* or *Newton's* fusible metal, viz., between 150° and 160° F.; he draws particular attention to the singular property of *cadmium* in promoting the fusibility of certain metals, which must soon find some useful applications.

ARSENIC IN COAL.—Dr. Angus Smith found this poisonous metal in thirteen out of fifteen specimens of Lancashire coal which he examined; a fact which has a very distinct bearing on our sanitory knowledge, as we must now add *arsenic* to the number of impurities in the atmosphere of our large towns. Mr. Dugald Campbell states also, in reference to this subject, "I have not yet met with a sand from the source or bed of a stream or river that does not contain arsenic, and perhaps antimony also."

PRODUCTION OF INTENSE COLD.—Messieurs Loir and Drion have described a method by which many of the gases may be liquefied in considerable quantities. It depends on the cold produced by the evaporation of volatile liquids; *e. g.* by blowing a current of dry air through several tubes into about seven ounces of *ether*, a temperature of —34° F. can be obtained, by which sulphurous acid gas may be liquified; if, now, this liquid sulphurous acid be substituted for ether, a minimum temperature of —50° F. may be obtained; and when liquid ammonia is used as the cooling agent, the thermometer sinks to —87° F. By this temperature the authors are able to liquefy carbonic acid gas under the atmospheric pressure.

DENSITY OF ICE.—M. Dufour has determined this vexed question by a new method of experimenting, which is as simple as it is exact. He made a mixture of water and alcohol, of such a density that ice floated in it in equilibrium; he then determined the density of the liquid mixture; the mean of his experiments gave the number 0·9175 for the density of ice at O°C, which is almost exactly that obtained by C. Brunner, by an entirely different method.

THE COLOURING MATTER OF LEAVES.—When leaves are extracted by alcohol a green oil is obtained, which is called *chlorophyll*. Fremy has ascertained that this consists of a *blue* and a *yellow* principle, which he has succeeded in isolating. To the blue principle he has given the name *vhyllocyanine*, and to the yellow the name *phylloxanthine*. Leaves which become yellow in autumn contain only the latter.

IODINE IN RAIN-WATER.—M. Chatin informs the Academy of Sciences of Paris that he has found *iodine* in the rain-water of Paris, and also in that of Pisa, Florence, and Lucia; and that although he had not succeeded in obtaining that element in its natural state from these waters, he had extracted it from two aquatic plants, viz., the *nasturtium officinale* and the *ceratophyllum demersum*, a fact which showed that the water in which they grew must have contained some.

PREPARATION OF CARBONIC ACID ON THE LARGE SCALE.—Messieurs Meschelynek and Lionnet have devised the following very simple and cheap method:—refractory earthen retorts, filled with chalk, are heated to dull redness in a reverberatory furnace; currents of steam are then passed through the retorts, when large quantities of carbonic acid are immediately evolved.

PREPARATION OF PERMANGANATE OF POTASH.—Béchamp recommends the following method:—In an iron basin ten parts of powdered binoxide of manganese are mixed with twelve parts of fused caustic potash; a little water is added to the mixture, which is rapidly dried, and introduced while still hot into a tubulated stoneware retort, and a current of pure dry oxygen passed into it. To the neck of the retort a tube is fitted, just dipping under mercury. The absorption of oxygen is very rapid; it is complete when it bubbles through the mercury. The cooled mass is then exhausted with hot water, and a current of carbonic acid passed through the solution, by which the manganate is transformed into permanganate; when the solution has the characteristic colour of the permanganate the current of gas is stopped, the oxides of manganese are allowed to settle, and the clear solution rapidly evaporated and allowed to crystallize. In general, a pound of binoxide gives five or six ounces of permanganate at the first crystallization.

Estimation of Magnesia in presence of Alkalies.—Scheerer converts the whole into neutral sulphates and weighs, re-dissolves in a small quantity of water, and divides into two equal parts; in the one he determines the magnesia by phosphate of soda, and in the other the potash by bichloride of platinum. The soda is estimated from the difference.

Determination of Phosphoric Acid.—Chancel has suggested a method founded on the insolubility of tribasic phosphate of silver in a neutral liquid. The substance is dissolved in the least quantity of dilute nitric acid, and the solution diluted with water. The clear liquid is mixed with a sufficient quantity of nitrate of silver, and then with a slight excess of carbonate of silver in the cold. The phosphoric acid soon separates as yellow phosphate of silver; the precipitation is complete when the liquid no longer reddens blue litmus paper; the precipitate is then filtered, carefully washed, introduced into a flask, and dissolved in nitric acid. The silver is now precipitated by means of hydrochloric acid, and the filtered liquor supersaturated with ammonia, and the ammoniacal phosphate precipitated with sulphate of magnesia in the usual manner.

Another method, applicable to compounds of Phosphoric Acid with Alumina, Iron, or Chromium.—An acid nitrate of bismuth is prepared by dissolving one part of pure subnitrate ($Bi\,O_3\,N\,O_5 + a\,q$) in four parts of nitric acid of Sp. gr. 1·36, and adding to the solution thirty parts of water. Thus prepared the solution is not made turbid either by boiling, or by the addition of water. The substance to be determined is dissolved in distilled water; if necessary a small quantity of nitric acid is added, care being taken to avoid excess, and the solution diluted with water. If the solution contains sulphates or chlorides they must be removed, the former by adding nitrate of baryta, and the latter by nitrate of silver. The solution of acid nitrate of bismuth is then added, as long as a precipitate is formed; the precipitate which separate is of a beautiful white, very dense, and settling readily, more especially when warmed; the whole liquid is heated to boiling, filtered, and washed with boiling water; it is then dried and heated. It has the composition $Bi\,O_3\,P\,O_5$. Chancel says, this method is so accurate, and the precipitation so rapid, that it will be possible to estimate phosphoric acid by means of a standard solution of *acid nitrate of bismuth.*

Boracic Acid in Sea Water.—Dr. John Veatch states, that he has found appreciable quantities of boracic acid, in the form of borate of soda, in the sea water on the coast of California; he found it first at Santa Barbara, and subsequently at various points from San Diego to the Straits of Fuca; the quantity diminished towards the north, being barely perceptible in specimens of water brought from beyond Oregon.

Osmium.—An elaborate memoir on *osmious* acid has been communicated by Professor Mallet, to *Siliman's American Journal.* Speaking of the position of *osmium* in the list of elements, he says, "Reviewing the united physical and chemical characters of osmium, and comparing them with those of the generally recognised members of the 'Arsenic group,' we are, I think, justified in concluding that it is here, that this curious metal should be placed in a natural arrangement of the elements; while important distinctions seem to separate it from some, at least, of the platinum metals, with which it is usually associated and described."

Aluminium.—M. Degousse, a goldbeater in Paris, has succeeded in preparing aluminium in fine plates, like gold or silver; in this state it is readily combustible, burning in the flame of a spirit lamp with great brilliancy: a square inch weighs only one milligramme (·01544 gr.); if a leaf be pressed together, placed in a bulb, and heated by means of a spirit lamp, in a current of oxygen, it burns with a dazzling, lightning-like appearance. Aluminium wire also burns in oxygen, like iron. Aluminium leaf decomposes boiling water, although the compact metal does not.

Physical Effects of Arsenic.—Schmidt and Stürzwage have made experiments on birds and animals, from which they draw the conclusion that arsenious acid introduced into the organism occasions a considerable diminution in the secretion of matter, which explains a fact well known to horse dealers, that horses fatten after the administration of small doses of arsenious acid. That quantity of fat, and of albumen, which corresponds to the depression in the secretion of carbonic acid and urea remains in the body; and if the animal receive adequate nourishment its weight increases.

Composition of the Photographic Image—Mr. Spiller has made some experiments, from the results of which he concludes, 1st. That chloride of silver, when decomposed by light, is separated into its elements. 2nd. That this change does not usually extend to the whole bulk of the material operated upon, on account of the opacity of the darkened product mechanically protecting a certain portion of unaltered chloride of silver from the action of light. 3rd. That the degree and rapidity of reduction is influenced by the state of division of the particles, and by the presence of agents capable of absorbing the chlorine when liberated from its combination with silver.

GENERAL NOTES ON THE YEAR.

School of Pharmacy.—The Pharmaceutical Society's Establishment in Bloomsbury Square has been greatly enlarged and improved during the past year. In the new laboratories working-places are provided for sixty pupils, and the general arrangements are very complete. The whole suit of laboratories is on one floor, with store-room and balance-rooms immediately beneath it: as heretofore, synthetical and analytical operations are conducted in different compartments, but the whole are now so far united that every pupil can observe what is being done by others, and can thus profit to some extent, from the experience of those with whom he is associated. The new lecture theatre is of ample size, and capable of affording all the accommodation required in that department.

United Society of Chemists and Druggists.—This Society, the idea of which was originated by some of the correspondents of our Journal, has met with efficient support. We believe the first month of the present year will see it raised from the caterpillar to the butterfly state. A meeting of the trade is about being called to pass the rules, &c.; after which, it may be considered fairly entitled to be enrolled amongst the facts given birth to during the past year.

Legislation.—A Bill for preventing the Adulteration of Articles of Food or Drink was prepared and brought in by Mr. Scholefield, Mr. Wise, and Mr. Villiers, in the early part of the session. In our March issue we gave our opinion as to the merits of the Bill. The Bill to amend the law relating to the Unlawful Administering of Poison, prepared and brought in by Mr. Clive and Sir George Lewis in February last, does not relate to the sale of poisons, and can have no effect on the business of the Chemist and Druggist.

Cases of Poisoning.—We have had to notice in the columns of our Journal many serious fatal cases which have resulted from the reckless use of poisonous agents in the adulteration of food, in the decoration of our houses, and in the manufacture of our apparel. It is to be hoped that ere long more effectual measures will be taken to protect the public from being poisoned by paper-stainers and muslin-dyers, than those which have been hitherto adopted with respect to bakers and manufacturers of coloured confectionery. The past twelve months have also unfortunately been fruitful in cases of intentional poisoning.

The Medical Profession.—From a report just made it appears that 1,237 students have registered their attendance this session at the metropolitan schools, being an increase over the number of last session by 132; a corresponding increase has not only taken place in the provincial schools, and in Scotland and Ireland, but also abroad. In Paris, for example, the inscriptions this session amount to 1,196, being 1,132 for the doctorate, and 641 for the lower grade of *Officier de Santé*. In the past session the total inscriptions amounted to 988 only. There is no doubt that the increase in the medical schools of the United Kingdom is owing to a desire on the part of the students to escape the new regulations of the examining boards, which come into operation this month.

TRADE NOTES.—CHEMICALS*.

Soda Ash, Soda Crystals, Bi-carb Soda, and Bleaching Powder.—These during the first six months remained steady, but gradually from July to the present time declined from 5 to 10 per cent., in consequence of a great falling off in the exports and re-sales by exporters; the present prices are unusually depressed and unremunerative to the manufacturers, none of whom are disposed to contract for forward delivery unless at advanced prices.

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* For much of the following we are indebted to our contemporary, the "Public Ledger."

BRIMSTONE,—The demand for this article has been quite equal to the supply; notwithstanding the immense consumption of pyrites obtained from Belgium, Spain, and our own country, prices have been unusually high throughout the year, advancing from 8*l.* 15*s.* per ton at this time last year to 10*l.* 10*s.* in July, gradually receding to the present quotation of 9*l.* 10*s.* for best seconds. Large quantities of flowers of sulphur will be required for the vines in Oporto and other places, and during the last three months considerable orders have reached this and other markets, which have been taken and partially executed at from 16*l.* to 17*l.* per ton.

TARTARIC ACID has maintained high prices throughout the year. In January it opened at 1*s.* 10*d.*, advanced to 2*s.* 1*d.* in March and April, declining to 2*s.* in May, 1*s.* 11½*d.* June, 1*s.* 11*d.* July, 1*s.* 10½*d.* in August and September, then recovered to 1*s.* 11*d.* in October and November, and reached 2*s.* 1*d.* in December.

CITRIC ACID opened at 2*s.* 3*d.* per lb., and advanced during February and March to 2*s.* 4*d.*, from which it gradually declined to 1*s.* 10*d.* in August and September, then recovered to 1*s.* 11*d.* in October and November, and 2*s.* 1½*d.* in December; the present quotation is 2*s.* 1*d.*, but for forward delivery there are no sellers under 2*s.* 3*d.* With the present reduced stock, and high price of lemon juice, further advance is anticipated.

OXALIC ACID during the first six months was stationary at 8½*d.* per lb., with little doing; remaining neglected, declined to 8¼*d.* in July, and 8*d.* in August, recovering to 8¼*d.* in November, and 8½*d.* to 9*d.* in December. One or two makers have receded from the trade in consequence of its being unremunerative.

PRUSSIATE POTASH.—There has been a fair average demand for this article, but contrary to expectation no advance during the year. For the first two months the price was 1*s.* 3½*d.* per lb., from March to October 1*s.* 3*d.*, November and December 1*s.* 2½*d.* the present price; there seems no prospect of any improvement.

BI-CHROMATE POTASH has remained very steady, from January to April the price was 11*d.* per lb., May to December 10¾*d.* There has been an average demand, and the supply at times limited; the present value is 10½*d.*

ROSIN.—The fluctuations in prices have been considerable; for instance, common was 4*s.* 9*d.* in January, and 6*s.* 3*d.* in November, medium has ruled throughout the year from 6*s.* to 10*s.*, while pale virgin has maintained a good price, being 14*s.* in January, and 15*s.* at present time. The demand has been good for common and virgin, and the stock small, while medium has been neglected, still leaving us with a large stock in hand, as was the case this time last year.

NAPHTHA, both mineral and vegetable, have been in request throughout the year, but more particularly during the last six months; the quantity of the former consumed both at home and abroad (for the purpose of extracting the benzole from, and which is required for the manufacture of analine, the staple of the new colours roseine and magenta) has been so considerable that the supply has scarcely met the demand, and an advance of 100 per cent. in the price of analine has consequently taken place, the quotation last February being 6*s.* 6*d.*, and at present 13*s.* per lb., with every prospect of a further considerable advance should the extraordinary demand continue. Vegetable advanced 9*d.* per gallon during the year, mineral about 3*s.*

OIL OF VITRIOL OR SULPHURIC ACID during the year has been selling at very low prices; the demand for the manure trade has fallen short of that of former years, which, with the continued high price of brimstone, cannot have left the manufacture very remunerative to the makers.

SULPHATE AMMONIA.—A fair demand has been experienced at prices as follow:—13*s.* 6*d.* to 14*s.* 6*d.* up to March, advancing 6*d.* per cwt. in April, then declining 6*d.* to 1*s.* in July, recovering in November to present quotation of 14*s.* 6*d.* for the best white. The stock is not large, and better prices are anticipated as the spring advances.

SUNDRIES.—*Sal-Ammoniac* has varied in price about 2*s.* per cwt. during the year. In January last it was 33*s.* to 34*s.*, and now 32*s.* to 33*s.*, with a fair demand. *Sulphate Copper.*—In January last the price was 35*s.*, and during the following six months remained at 36*s.*, but declined about 2*s.* per cwt. during the last four or five months, present price being 34*s.* for first quality. *Chlorate Potash* has met with an average demand, gradually giving way about 1½*d.*

per lb.; the price at this time last year was 1*s.*, in September 10½*d.*, at which it is now quoted, though the best makes fetch 11*d.* *Alum* has ruled low throughout the year, though the demand has been good. *Sugar of Lead.*—Very little change in price took place in this article during the first ten months, but since then, in consequence of a heavy market, prices have gradually given way 2*s.* to 3*s.* per cwt., and now is quoted 36*s.* for the best white. *Salts of Tartar.*—A steady trade has been done in this article at 42*s.* per cwt. during the first four months, and 41*s.* since, the present value. *Borax* has throughout the year remained at 65*s.* for best English refined, with a fair trade. *Epsom Salts* have been in request at 8*s.* to 8*s.* 6*d.* per cwt. *Arsenic.*—White Powdered —This article is of uncertain value and very changeable; at this time last year it was quoted at 10*s.* 6*d.* per cwt., and remained at that till May, when 13*s.* was quoted up to August, then 12*s.* to November, while in December it fell to 8*s.* 6*d.* for best make, the present price. *Iodine* has come down to such an extraordinary low price that it is impossible to say what is to become of it; it is, however, still produced, and therefore it is presumed pays the manufacturer; at this period last year it was quoted at 6¼*d.* to 6¾*d.*, lower quotations have been known heretofore, but now may be had at 4¾*d.* to 5¼*d.* per oz.: there is a considerable stock, with but a very limited demand.

LIVERPOOL CHEMISTS' ASSOCIATION.

A CONVERSAZIONE in connection with this Association was held on the evening of Thursday, the 20th ultimo, at the Royal Institution, and was quite a successful and brilliant affair. The rooms were crowded with a fashionable company of some 300 or 400 persons. Every department of the noble institution was thrown open for promenade. Each department was exceedingly interesting,—the superb museum of natural history, conchology, fossils, &c.; the valuable collection of curiosities from foreign climes, the geological gallery, and the gallery of art; in the latter were exhibited the paintings and drawings of the pupils of the Royal Institution School, some of which evince talent of no mean order. Several members of the Association, and tradesmen of the town, furnished a variety of articles, consisting of scientific instruments, works of art, &c.

In the geological gallery a large variety of microscopic objects and interesting natural productions were exhibited.

The two lower rooms were fitted up for the dispensing of refreshments, which were abundantly and admirably served.

Upwards of two hours having been spent in inspecting the various objects of interest, the company adjourned, about half-past eight, to the lecture hall, where the chair was taken by Dr. Edwards, the President of the Association, who delivered some explanatory observations on spectrum analysis, polarised light, and magnetic and electric light, illustrated by interesting and instructive experiments, comprising projections by the oxycalcium lantern and polariscope, and by electrical discharges in vacuo, &c. &c. The address of the chairman was of an able character, affording a great amount of information upon the subject in question. In the course of his remarks he referred to Messrs. Kirchkoff and Bunsen's spectra-meter, for the chemical analysis of substances. This instrument was exhibited and explained by Mr. I. B. Cooke. The President also exhibited one of Professor Way's new electric lamps, a very compact and comparatively inexpensive article, adapted for lighthouse purposes. Thus ended a most agreeable evening.

The general arrangements of the Conversazione, carried out under the superintendence of the Committee and the excellent Secretary, Mr. T. D. Walker, of Ranelagh-street, were satisfactory in every respect, and did those gentlemen much credit.

THE "CHEMIST AND DRUGGIST" ALMANACK.

WITH our last number we issued an Almanack for 1861, containing several useful tables which have been expressly prepared for it. Anticipating an increase of subscribers, we caused a thousand extra impressions of this Almanack to be struck off, and we shall be happy to send one to any new subscriber to the Journal.